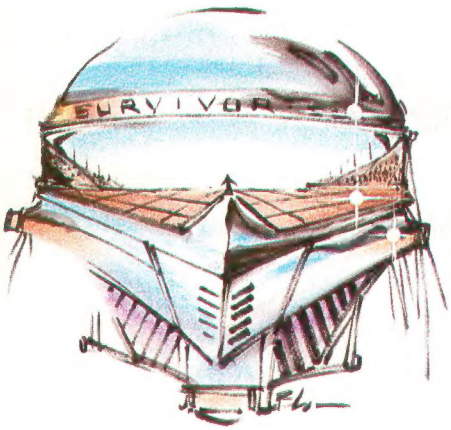
Buyer's Guide To Modems

COMPUTE!'s GAZETTE

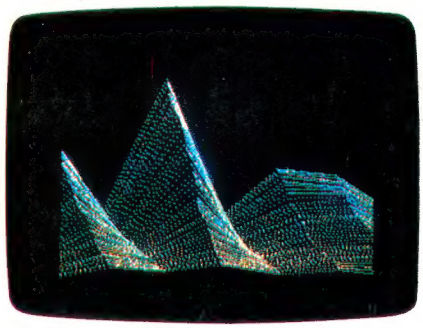
$2.95
March 1986
Issue 33, Vol. 4, No. 3
02220 $3.75 Canada

FOR **COMMODORE** PERSONAL COMPUTER USERS



Survivor

If you're quick of mind, eye, and hand, you might outfox your opponent. A two-player contest for the 64.



What's New Online

Going online is easier and better than ever—especially for Commodore users.

The Coordinator

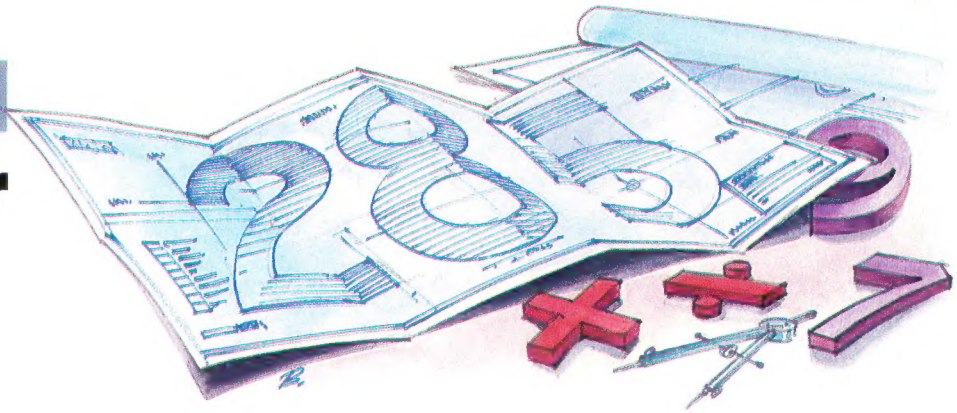
Unlock the full creative potential of dazzling hi-res graphics on the Commodore 64 with this extraordinary multi-featured utility.

Also In This Issue:

128 Auto Boot
User Group Update
Software Reviews
And More

Cataloger

Organize your entire Commodore 128 or 64 disk library with this easy-to-use menu-based program.



Number Construction Kit

For children, here's an exciting way to practice and improve math skills. For adults, a real brain teaser. A clever educational tool for the Commodore 64, Plus/4, and 16.

0 71486 02220 03

(No I.D. required for half-elves.)

When the Going Gets Tough, the Bard Goes Drinking.

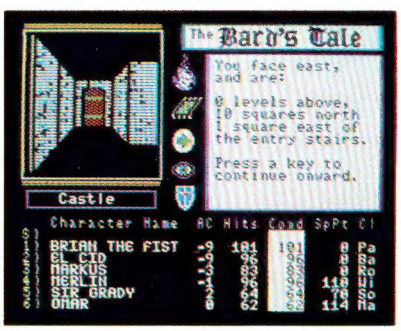
And the going is tough in Skara Brae town. The evil wizard Mangar has cast an eternal winter spell. Monsters control the streets and dungeons beneath. Good citizens fear for their lives. What's worse, there's only one tavern left that serves wine.

But the Bard knows no fear. With his trusty harp and a few rowdy minstrel songs he claims are magic, the Bard is ready to boogie. All he needs is a band of loyal followers: a light-fingered rogue to find secret doors, a couple of fighters to bash heads, a conjurer to create weird allies, a magician for magic armor.

Then it's off to combat, as soon as the Bard finishes one more verse. Now what's a word that rhymes with "dead ogre?"

4 classes of magic user, including wizard and sorceror. 85 new magic spells in all.

128 color monsters, many animated. All challenging.



Full-color scrolling dungeons. 16 levels, each better than the one before. 3-D city, too.

Optional use of characters created in Wizardry® or Ultima III.®

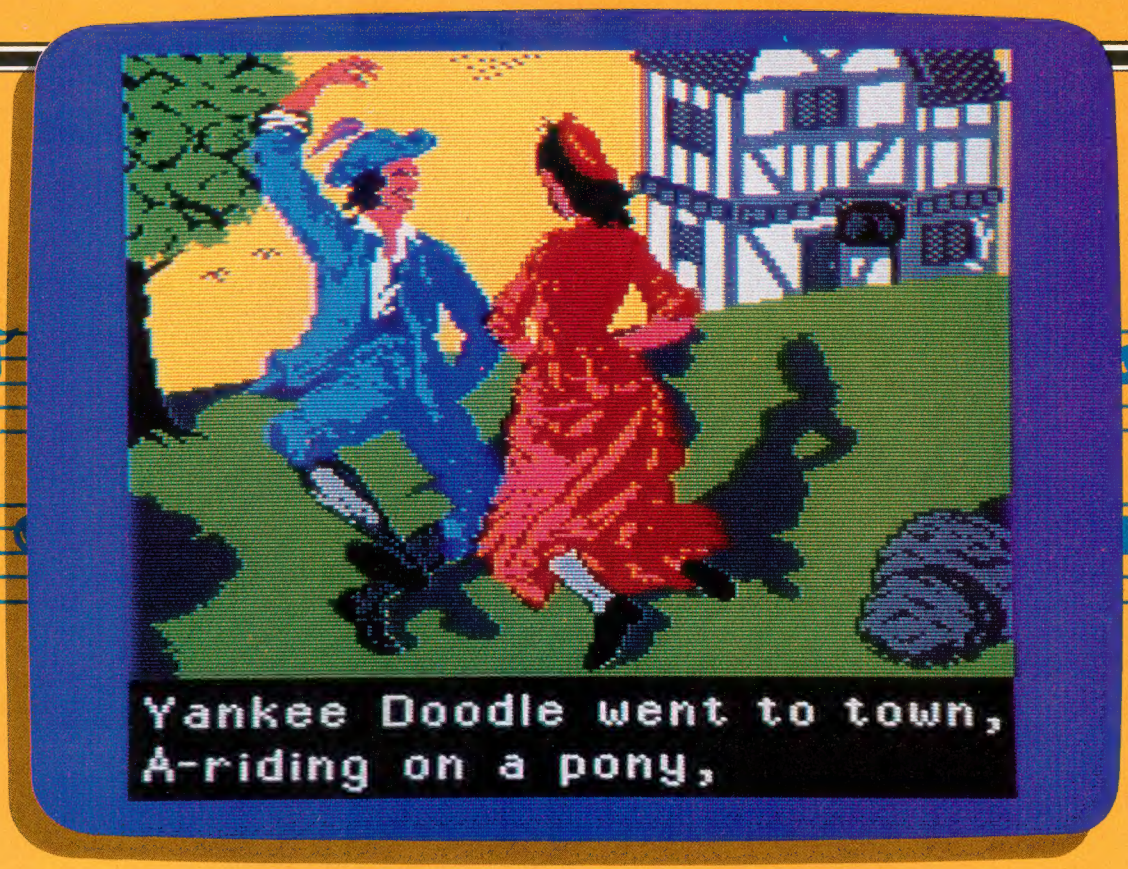
The Bard's Tale™

from

ELECTRONIC ARTS™

Specs: 100% machine language, 400K worth on 2 disks. 64K RAM minimum; enhanced for 128K. Now available for Apple II family for $44.95, C-64 & 128 for $39.95.
To order: Visit your retailer or call (800) 227-6703 (In Calif. call (800) 632-7979) for VISA or MasterCard orders. To purchase by mail, send check or money order to Electronic Arts, P.O. Box 306, Half Moon Bay, CA 94109. Add $3 for insured shipping and handling. Allow 1-4 weeks for delivery. The Bard's Tale is worth the wait.

Apple is a trademark of Apple Computer. Wizardry is a registered trademark of Sir-Tech Software, Inc. Ultima is a registered trademark of Richard Garriott. The Bard's Tale and Electronic Arts are trademarks of Electronic Arts. For a copy of our complete catalogue and direct order form, send $.50 and a stamped, self-addressed envelope to Electronic Arts, 2755 Campus Drive, San Mateo CA 94403.



Sing Along With Your Favorite Party Songs

Here's a great new way for you and your friends to have fun with your Commodore 64™ or 128™. Our exciting Party Songs disk features 18 classics you'll love to sing. They are loaded with humor and nostalgia—just right for when friends get together.

For sing-along fun, the lyrics appear in easy-to-read verse on your TV or monitor. Play just your favorite song or set your computer to play them all.

If you've seen our Christmas Carols, then you know Party Songs will be a treat. Your computer's vast musical capabilities are used to their fullest to create lively music in three-part harmony. The colorful and entertaining graphics make every song a visual delight.

SONGS INCLUDE:

- Auld Lang Syne • I've Been Workin' on the Railroad
- Oh My Darling Clementine • Blow the Man Down
- For He's a Jolly Good Fellow • Bill Groggin's Goat
- Hail! Hail! The Gang's All Here! • My Wild Irish Rose
- My Old Kentucky Home • Turkey in the Straw
- My Bonnie Lies Over the Ocean • Goober Peas
- Red River Valley • Oh! Susanna • Dixie
- The Yellow Rose of Texas • Yankee Doodle
- Who Threw the Overalls in Mistress Murphy's Chowder?

For fun throughout the Christmas holidays, order our Christmas Carols, too! The disk contains 18 favorites, including O Come All Ye Faithful, Joy to the World, Jingle Bells, Silent Night, What Child is This?, and more.

As always, you can trust John Henry Software to bring you quality software at the lowest price. We specialize in prompt delivery and guarantee our product.

Don't wait, see your dealer, or call us today!
Toll-free number:

1-800-223-2314
In Ohio call 513-898-7660

$15.95 each

Both for only $28.95

Please send me:
_____ Party Songs disk(s) at $15.95 each
_____ Christmas Carols disk(s) at $15.95 each
_____ Christmas Carols and Party Songs at $28.95

Add $1.00 for postage and handling. Ohio residents add 6% sales tax. Foreign orders, except Canada and APO, add $3.00 for Air Mail. Please pay in U.S. funds.

☐ Check or money order enclosed ☐ Visa ☐ MasterCard

Acct. # _____ Exp. Date _____

Name _____

Address _____

City _____ State _____ Zip _____

Send to John Henry Software, P.O. Box 745, Vandalia, Ohio 45377.

John Henry Software
QUALITY IS OUR STRENGTH

SOME HISTORIC BREAKTHROUGHS DON'T TAKE AS MUCH EXPLAINING AS COMPUSERVE.

But then, some historic breakthroughs could only take you from the cave to the tar pits and back again.

CompuServe, on the other hand, makes a considerably more civilized contribution to your life.

It turns that marvel of the 20th century, the personal computer, into something useful.

Unlike most personal computer products you read about, CompuServe is an information service. It isn't software. It isn't hardware. And you don't even have to know a thing about programming to use it. You subscribe to CompuServe —and 24 hours a day, 7 days a week, it puts a universe of information, entertainment and communications right at your fingertips.

A few of the hundreds of things you can do with CompuServe.

COMMUNICATE

EasyPlex™ Electronic Mail lets even beginners compose, edit, send and file messages the first time they get online. It puts friends, relatives and business associates—anywhere in the country —in constant, convenient touch.

CB Simulator features 72 channels for "talking" with thousands of other enthusiastic subscribers throughout the country and Canada. The chatter is frequently hilarious, the "handles" unforgettable, and the friendships hard and fast.

More than 100 Forums welcome your participation in "discussions" on all sorts of topics. There are Forums for computer owners, gourmet cooks, investors, pilots, golfers, musicians, you name it! Also, Electronic Conferencing lets businesses put heads together without anyone having to leave the shop.

Bulletin Boards let you "post" messages where thousands will see them. You can use our National Bulletin Board or the specialized Bulletin Boards found in just about every Forum.

HAVE FUN

Our full range of games includes "You Guessed It!", the first online TV-style game show you play for real prizes; and MegaWars III, offering the ultimate in interactive excitement. And there are board, parlor, sports and educational games to play alone or against other subscribers throughout the country.

Movie Reviews keep that big night at the movies from being a five star mistake.

SHOP

THE ELECTRONIC MALL℠ gives you convenient, 24-hour-a-day, 7-day-a-week shopping for name brand goods and services at discount prices from nationally known stores and businesses.

SAVE ON TRIPS

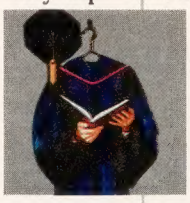
Travelshopper℠ lets you scan flight availabilities (on virtually any airline — worldwide), find airfare bargains and order tickets right on your computer.

Worldwide Exchange sets you up with the perfect yacht, condo, villa, or whatever it takes to make your next vacation *a vacation*.

A to Z Travel/News Service provides the latest travel news plus complete information on over 20,000 hotels worldwide.

MAKE PHI BETA KAPPA

Grolier's Academic American Encyclopedia's Electronic Edition delivers a complete set of encyclopedias right to your living room just in time for today's homework. It's continuously updated... and doesn't take an inch of extra shelf space.



The College Board, operated by the College Entrance Examination Board, gives tips on preparing for the SAT, choosing a college and getting financial aid.

KEEP HEALTHY

Healthnet will never replace a real, live doctor—but it is an excellent and readily available source of health and medical information for the public.

Human Sexuality gives the civilization that put a man on the moon an intelligent alternative to the daily "Advice to the Lovelorn" columns. Hundreds turn to it for real answers.

BE INFORMED

All the latest news is at your fingertips. Sources include the AP news wire (covering all 50 states plus national news), the Washington Post, USA TODAY Update, specialized business and trade publications and more. You can find out instantly what Congress did yesterday; who finally won the game; and what's happening back in Oskaloosa with the touch of a button. And our electronic clipping service lets you tell us what to watch for. We'll electronically find, clip and file news for you...to read whenever you'd like.

INVEST WISELY

Comprehensive investment help just might tell you more about the stock you're looking at than the company's Chairman of the Board knows. (Don't know who he is? Chances are, we can fill you in on that, too.) CompuServe gives you complete statistics on over 10,000 NYSE, AMEX and OTC securities. Historic trading statistics on over 50,000 stocks, bonds, funds, issues and options. Five years of daily commodity quotes. Standard & Poor's. Value Line. And more than a dozen other investment tools.

Site II facilitates business decisions by providing you with demographic and sales potential information by state, county and zip code for the entire country.

National and Canadian business wires provide continuously updated news and press releases on hundreds of companies worldwide.

GET SPECIALIZED INFORMATION

Pilots get personalized flight plans, weather briefings, weather and radar maps, newsletters, etc.

Entrepreneurs use CompuServe too for complete step-by-step guidelines on how to incorporate the IBMs of tomorrow.

Lawyers, doctors, engineers, military veterans and businessmen of all types use similar specialized CompuServe resources pertinent to their unique needs.

And now for the pleasant surprise.

Although CompuServe makes the most of any computer, it's a remarkable value. With CompuServe, you get low start-up costs, low usage charges and local phone-call access in most major metropolitan areas.

Here's exactly how to use CompuServe.

First, relax.

There are no advanced computer skills required.

In fact, if you know how to buy breakfast, you already have the know-how you'll need to access any subject in our system. That's because it's "menu-driven," so beginners can simply read the menus (lists of options) that appear on their screens and then type in their selections.

Experts can skip the menus and just type in "GO" followed by the abbreviation for whatever topic they're after.

In case you ever get lost or confused, just type in "H" for help, and we'll immediately cut in with instructions that should save the day.

Besides, you can either ask questions online through our Feedback service or phone our Customer Service Department.

How to subscribe.

To access CompuServe, you'll need a CompuServe Subscription Kit, a computer, a modem to connect your computer to your phone, and in some cases, easy-to-use communications software. (Check the information that comes with your modem.)

With your Subscription Kit, you'll receive:

- a $25 usage credit.
- a complete hardcover Users Guide.
- your own exclusive user ID number and preliminary password.
- a subscription to CompuServe's monthly magazine, *Online Today.*

Call **800-848-8199** (in Ohio, 614-457-0802) to order your Subscription Kit or to receive more information. Or mail this coupon.

Kits are also available in computer stores, electronic equipment outlets and household catalogs. You can also subscribe with materials you'll find packed right in with many computers and modems sold today.

☐ Please send me additional information.
☐ Please send me a CompuServe Subscription Kit.
☐ I am enclosing my check for $39.95, plus $2.50 handling. *(Add sales tax if delivered in Ohio.)*

Please make check payable to CompuServe Information Services, Inc.

☐ Charge this to my VISA/MasterCard

#_____

Expiration Date _____

Signature _____

Name _____

Address _____

City _____

State _____ Zip _____

MAIL TO:

CompuServe®

Customer Service Ordering Dept.
P.O. Box L-477
Columbus, Ohio 43260

PRI-603

An H&R Block Company

EasyPlex and ELECTRONIC MALL are trademarks of CompuServe, Incorporated. Travelshopper is a service mark of TWA.

A Printer For All Reasons

Search For The Best High Quality Graphic Printer

If you have been looking very long, you have probably discovered that there are just too many claims and counter claims in the printer market today. There are printers that have some of the features you want but do not have others. Some features you probably don't care about, others are vitally important to you. We understand. In fact, not long ago, we were in the same position. Deluged by claims and counter claims. Overburdened by rows and rows of specifications, we decided to separate all the facts — prove or disprove all the claims to our own satisfaction. So we bought printers. We bought samples of all the major brands and tested them.

Our Objective Was Simple

We wanted to find that printer which had all the features you could want and yet be sold directly to you at the lowest price. We didn't want a "close-out special" of an obsolete product that some manufacturer was dumping, so we limited our search to only those new printers that had the latest proven technology. We wanted to give our customers the **best** printer on the market today at a bargain price.

The Results Are In

The search is over. We have reduced the field to a single printer that meets all our goals (and more). The printer is the SP-1000 from Seikosha, a division of Seiko (one of the foremost manufacturers in the world). We ran this printer through our battery of tests and it came out shining. This printer *can* do it all. Standard draft printing at a respectable 100 characters per second, and with a very readable 12 (horizontal) by 9 (vertical) character matrix. This is a full bi-directional, logic seeking, true descender printer.

"NLQ" Mode

One of our highest concerns was about print quality and readability. The SP-1000 has a print mode termed Near Letter Quality printing (NLQ mode). This is where the SP-1000 outshines all the competition. Hands down! The character matrix in NLQ mode is a very dense 24 (horizontal) by 18 (vertical). This equates to 41,472 addressable dots per square inch. Now we're talking ***quality*** printing. It looks like it was done on a typewriter. You can even print graphics using the standard graphics symbols built into your computer. The results are the best we've ever seen. The only other printers currently available having resolution this high go for hundreds more.

Features That Won't Quit

With the SP-1000 your computer can now print 40, 48, 68, 80, 96, or 136 characters per line. You can print in ANY of 35 character styles including 13 double width and 3 reversed (white on black) styles. You not only have the standard Pica, Elite, Condensed and Italics, but also true Superscripts and Subscripts. Never again will you have to worry about how to print H_2O or X^2. This fantastic machine will do it automatically, through easy commands right from your keyboard. Do you sometimes want to emphasize a word? It's easy, just use **bold** (double strike) or use *italics* to make the words stand out. Or, if you wish to be even more emphatic, underline the words. You can combine many of these modes and styles to make the variation almost endless. Do you want to express something that you can't do with words? Use graphics with your text — even on the same line. You have variable line spacing of 1 line per inch to infinity (no space at all) and 143 other software selectable settings in between. You can control line spacing on a dot-by-dot basis. If you've ever had a letter or other document that was just a few lines too long to fit a page, you can see how handy this feature is. Simply reduce the line spacing slightly and ... VOILA! The letter now fits on one page.

Forms? Yes! Your Letterhead? Of Course!

Do you print forms? No problem. This unit will do them all. Any form up to 10 inches wide. The tractors are adjustable from 4 to 10 inches. Yes, you can also use single sheets. Plain typing paper, your letterhead, short memo forms, labels, anything you choose. Any size to 10" in width. In fact this unit is so advanced, it will load your paper automatically. Multiple copies? Absolutely! Use forms (up to 3 thick). Do you want to use spread sheets with many columns? Of course! Just go to condensed mode printing and print a full 136 columns wide. Forget expensive wide-carriage printers and changing to wide carriage paper. You can now do it all on a standard 8½" wide page, and you can do it quietly. The SP-1000 is rated at only 55 dB. This is quieter than any other impact dot matrix printer that we know of and is quieter than the average office background noise level.

Consistent Print Quality

Most printers have a ribbon cartridge or a single spool ribbon which gives nice dark printing when new, but quickly starts to fade. To keep the printers output looking consistently dark, the ribbons must be changed quite often. The SP-1000 solves this problem by using a wide (½") ribbon cartridge that will print thousands of pages before needing replacement. (When you finally do wear out your ribbon, replacement cost is only $11.00. Order *#2001.)*

The Best Part

When shopping for a printer with this quality and these features, you could expect to pay much more. *Not now!* We sell this fantastic printer for **only $239.95! You need absolutely nothing else to start printing — just add paper (single sheet or fanfold tractor).**

No Risk Offer

We give you a 2-week satisfaction guarantee. If you are not completely satisfied for any reason we will promptly refund your purchase. The warranty has now been extended to 2 years. The warranty repair policy is to repair or replace and reship to the buyer within 72 hours of receipt.

The Bottom Line

Be sure to specify the order # for the correct version printer designed for your computer.

Commodore C-64 & C-128, Order #2200, graphics interface & cable built in.

IBM-PC and compatibles, Order #2100, plus 8' shielded cable #1103, $26.00

Standard Parallel with 36 pin Centronics connector, Order #2400, no cable

Standard Serial with RS-232 (DB-25) Connector, Order #2500, no cable

We also have interfaces and cables for many other computers not listed. Call Customer Service at 805/987-2454 for details.

Shipping and insurance is $10.00 — UPS within the continental USA. If you are in a hurry, UPS Blue (second day air), APO or FPO is $22.00. Canada, Alaska, Mexico are $30.00 (air). Other foreign is $70.00 (air). California residents add 6% tax. The above are cash prices — VISA and MC add 3% to total. We ship the next business day on money orders, cashiers' checks, and charge cards. A 14-day clearing period is required for checks.

Dealer inquiries invited
For information call 805/987-2454

TO ORDER CALL TOLL FREE

1-(800) 962-5800 USA
1-(800) 962-3800 CALIF. **(8-6 PST)**

or send order to:

APROTEK

1071-A Avenida Acaso
Camarillo, CA 93010

GAZETTE contents

March 1986 Vol. 4, No. 3

features

What's New Online for Commodore *Kathy Yakal*	18	*
The Commodore SIG *Kathy Yakal*	26	*
A Buyer's Guide to Modems	30	*

reviews

Movie Maker *Lee Noel, Jr.*	46	64
Perry Mason: The Case of the Mandarin Murder *George Miller*	46	64
Dambusters *James Trunzo*	50	64
Fighter Command *George Miller*	56	64
Spellbreaker *Selby Bateman*	56	64
Touchdown Football *Selby Bateman*	60	64

games

Survivor *Kevin Mykytyn and Mark Tuttle*	36	64/+4/16
Shifter *Kevin Mykytyn and Mark Tuttle*	40	64/+4/16

education/home applications

Computing for Families: Storytelling to Read *Fred D'Ignazio*	67	*
Number Construction Kit *Gerald W. Rightmer*	86	64/+4/16

programming

Hints & Tips: Timesavers	65	128/64/+4/16/V
BASIC Magic: String Variables in READ and DATA Statements *Michael S. Tomczyk*	68	64/+4/16/V
Machine Language for Beginners: Machine Maps *Richard Mansfield*	70	128/64/V
Power BASIC: Keyboard to Joystick Coverter *David A. Dunn*	71	64
The Coordinator *Lee Noel, Jr.*	72	64
Storage and Display: Using Peripherals with the 128	76	128
ASCII Teleconverter *Ken Stange*	78	64/+4/16/V
Cataloger *Kevin Mykytyn*	79	128/64/+4/16
VICDump *Henk de Bruyn*	80	V
128 Auto Boot *Steve Stiglich*	82	128
Clavier 64 *Peter Sribniak*	84	64

departments

The Editor's Notes *Robert Lock and Lance Elko*	6	*
Gazette Feedback *Editors and Readers*	10	*
User Group Update	34	*
Simple Answers to Common Questions *Tom R. Halfhill*	90	*
News & Products	91	*
Bug-Swatter: Modifications and Corrections	92	*

program listings

MLX: Machine Language Entry Program	93	64
COMPUTE!'s Gazette Author's Guide	96	*
Automatic Proofreader	97	128/64/+/16/V
How to Type In COMPUTE!'s Gazette Programs	98	*

Advertisers Index 128

*=General, **V**=VIC-20, **64**=Commodore 64, **+4**=Plus/4, **16**=Commodore 16, **128**=Commodore 128

COMPUTE!'s GAZETTE is published monthly by **COMPUTE!** Publications, Inc., 825 7th Avenue, New York, NY 10019 USA. Phone: (212) 265-8360. Editorial offices are located at 324 West Wendover Avenue, Greensboro, NC 27408. Domestic Subscriptions: 12 issues, $24. POSTMASTER: Send address changes to *COMPUTE!'s GAZETTE*, P.O. Box 10957, Des Moines, IA 50340. Second class application pending at Greensboro, NC 27403 and additional mailing offices. Entire contents copyright ©1986 by **COMPUTE!** Publications, Inc. All rights reserved, ISSN 0737-3716.

COMPUTE! Publications, Inc. is part of ABC Consumer Magazines, Inc., One of the ABC Publishing Companies: ABC Publishing, President, Robert G. Burton; 1330 Avenue of the Americas; New York, New York 10019.

editor's notes

Happy New Year. If these are the March Editor's Notes, it must be January 3. The radio this morning brought news that Commodore has announced that its manufacturing facility in Great Britain, closed for the Christmas holidays, will not be reopened. Two hundred and seventy manufacturing employees will lose their jobs. Commodore will maintain its marketing operation in Great Britain, which employs 170.

At least this new year is behaving in a consistent fashion. Jack Tramiel's Atari Corporation has announced that the Atari ST will be moving out into the fast lane—the mass merchandisers will soon be selling an unenhanced version for a price projected to be less than $500. Specialty stores are to be selling the newly enhanced mega-version.

The Winter Consumer Electronics Show is one week away, and we're anxious to see who's doing and not doing what in support of, or anticipation of, whom. You'll get all the details in next month's issue. This issue, we think, is a strong one, with a number of excellent articles and programs. The telecommunications area has undergone some major changes in recent months, and has opened up in a large way to Commodore owners. "What's New Online for Commodore" explores the growing number of choices and includes lots of helpful information for newcomers and experienced online users alike. For those on the verge of exploring this exciting field, "A Buyer's Guide to Modems" should take the mystery out of making that important hardware choice.

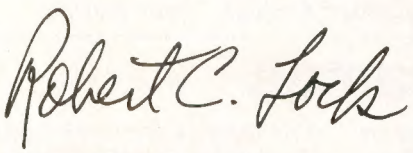
If you're considering the purchase of a Commodore 128, or if you've just bought one, be sure to see "Storage and Display: Using Peripherals with the 128," an excerpt from a new release by COMPUTE! Books. Commodore 128 owners will also be interested in "128 Auto Boot," a four-program set that lets you automatically load and run a program—from 128 or 64 mode with a 1571 or 1541 disk drive—after turning on your 128.

Disk drive owners who have been programming or typing in programs for any time at all will find "Cataloger" a useful organizational tool. It makes it easy to find any program on any disk in your collection, and includes several extra thoughtful features. It's designed for 128, 64, Plus/4, and 16 users. Another highly useful tool in this issue is "The Coordinator," a carefully designed package for the Commodore 64 graphics programmer. It offers a full-featured system that lets you create and save high-resolution color screens, all with the speed and efficiency of machine language.

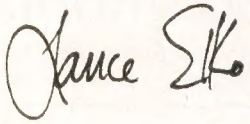
Two well-designed programs of educational value are "Number Construction Kit," for the 64, Plus/4, and 16, and "Clavier 64." The former is a clever way to practice and reinforce math skills. It includes three skill levels that cover a range of ages and abilities. Although it's primarily designed for math students younger than most of us here at COMPUTE!, we found it to be an entertaining challenge, sometimes embarrassingly so. Clavier 64 is an impressive three-voice music composer and player that's suitable for the casual tinkerer or serious composer. It can handle up to 35K of music data.

The games in this issue are each two-player contests that will provide hours of entertainment. "Survivor" and "Shifter" challenge the hand and eye as well as the mind. Both are designed to run on the 64, Plus/4, and 16.

In the months ahead, we have some excellent features, entertainment and educational software, and programming tools—all in all, the best value we can offer to Commodore owners. See you next month.



Editor In Chief



Editor

A Special Request

We remain keenly interested in tutorial and applications articles written by you, our readers. Many of you may not realize it, but much of what we publish here is freelance material contributed by you. Of necessity, we require creativity, a bit of uniqueness, topics we haven't covered fully or recently, and completeness. From our side we try to respond quickly, and urge that you understand in advance that, unavoidably, we many times feel that a particular topic has already been covered, or your submission happens to be ever so slightly overshadowed by someone else's on the same or a similar topic. We look forward to hearing from you.

POWERFUL C128 SOFTWARE

– BUT DON'T TAKE OUR WORD, SEE WHAT THE EXPERTS SAY!

WORD WRITER 128 with Spell Checker*

An 80-column professional word processing system for home and business use. Includes an 85,000 word spelling checker, built-in 5 function calculator, and on-screen highlighting.

"... Using WORD WRITER 128 is an absolute joy ... We found nothing but the highest quality."
Run Magazine

SWIFTCALC 128 with Sideways*

A powerful, easy-to-use electronic spreadsheet designed especially for home and small business use.

"... Everything you could possibly need is present in SWIFTCALC 128."
Run Magazine

"... SWIFTCALC 128 has most of the features of Lotus 1-2-3."+
Ahoy Magazine

+ And at less than half the price!

DATA MANAGER 128 with Report Writer*

A complete general information storage and retrieval system with report writing, graphics, statistics, and label making capabilities.

"... A powerful and flexible database management system that takes full advantage of the C128's potential."
Run Magazine

SYLVIA PORTER'S PERSONAL FINANCIAL PLANNER*

All the computer tools you'll ever need to help manage your money on a day-to-day basis *and plan your financial future, too.*

"... By far the most thorough and readable manual, one that will take you keystroke by keystroke through the construction of budgets and analysis of finance ... The screen layout was the best of the programs we looked at ... For beginners especially, it's a real standout."
New York Post

SIDEWAYS

The ingeniously simple software program that rotates your spreadsheet by 90 degrees as it prints out and causes your hard copy to print out – you guessed it – *sideways.*

"... One small program that solves a big problem for computer users."
New York Times

Our customer technical support gets great reviews, too!

"... The good news starts as soon as you open the package. A toll-free customer hotline number is printed on the inside front cover of the documentation for each program. The support person I spoke with knew the systems and specializes in them exclusively."
Ahoy Magazine

* WORD WRITER 128, SWIFTCALC 128, and DATA MANAGER 128 interface with each other. YOUR PERSONAL FINANCIAL PLANNER interfaces with WORD WRITER 128.

Back-up program disks can be purchased from Timeworks at a nominal charge. And, with every Timeworks program you're protected by our liberal UPGRADE AND EXCHANGE POLICY. Details are inside every Timeworks package.

Timeworks Money Back Guarantee**

If you can find anything that works better for you, simply send us your Timeworks program, your paid receipt, and the name of the program you want, along with your check or credit card number for any retail price difference. If it's available, we'll buy it for you.***

IF YOU CAN FIND A BETTER PROGRAM WE'LL BUY IT FOR YOU**

TIMEWORKS®

More power for your dollar

Timeworks, Inc., 444 Lake Cook Rd., Deerfield, IL 60015 (312) 948-9200

***Offer valid 90 days from date of purchase

© 1985 Timeworks, Inc. All rights reserved.

COMPUTE! Publications, Inc.
One of the ABC Publishing Companies

Publisher James A. Casella
Founder/Editor in Chief Robert C. Lock
Director of Administration Alice S. Wolfe
Senior Editor Richard Mansfield
Managing Editor Kathleen Martinek
Executive Editor Selby Bateman
Editor Lance Elko
Assistant Editor Todd Heimarck
Production Director Tony Roberts

Editors
Tom R. Halfhill, Editor, COMPUTE! Magazine; Stephen Levy, Editor, COMPUTE! Books Division; Gail Cowper, Production Editor; Ottis R. Cowper, Technical Editor; Charles Brannon, Program Editor

Assistant Editors
Gregg Keizer (Books); John Krause, George Miller, (Technical); Philip Nelson (COMPUTE! Magazine); Kathy Yakal, Assistant Features Editor; Joan Rouleau, Research/Copy Editor; Ann Davies, Copy Editor; Mark Tuttle, Submissions Reviewer

Editorial Programmers
Patrick Parrish (Supervisor), Tim Victor, Kevin Mykytyn

Programming Assistant
David Florance, David Hensley

Administrative Staff
Executive Assistant, Debi Nash; Julia Fleming, Iris Brooks, Mary Hunt, Sybil Agee

Production
Irma Swain, Production Manager; Janice Fary, Art & Design Director; Lee Noel, Assistant Editor, Art & Design; De Potter, Mechanical Art Supervisor; Terry Cash, Carole Dunton, Typesetting

Artists
Dabney Ketrow (Publications), Debbie Bray (Books); Harry Blair, Illustrator

Associate Editors
Jim Butterfield (Toronto), Harvey Herman (Greensboro), Fred D'Ignazio (Roanoke)

Customer Service
Diane Longo, Customer Service Manager; Orchid Tamayo, Dealer Sales Supervisor; Judy Taylor, Customer Service Supervisor

Receptionist, Anita Armfield

John Williams, Warehouse Manager

Data Processing
Leon Stokes, Manager; Chris Cain, Steve Bowman, Assistants

Accounting
R. Steven Vetter, VP, Finance & Planning

Promotion
Caroline Dark, Promotion Assistant

Advertising Sales
Ken Woodard, Director of Advertising Sales; Kathleen Hanlon, Production Coordinator

Sales Representatives

Jerry Thompson	415-348-8222
Ed Winchell	213-378-8361
Harry Blair	919-275-9809
John Saval	212-315-1665
Jonathan Just	212-315-1665

Address all advertising materials to:
Kathleen Hanlon, COMPUTE!'s GAZETTE
324 West Wendover Ave., Suite 200, Greensboro, NC 27408

Jules E. Thompson, Inc.
National Sales Representatives
1290 Howard Avenue, Suite 303
Burlingame, CA 94010

Sales Offices, Jules E. Thompson, Inc.

New England	617-720-1888
Mid-Atlantic	212-772-0933
Southeast	919-275-9809
Midwest	312-726-6047
Texas	713-731-2605
Pacific Northwest	415-348-8222
Northern CA	415-348-8222
Southern CA	213-378-8361
Arizona	213-378-8361
New Mexico	213-378-8361
Colorado	303-595-9299

COMPUTE! Publications, Inc., publishes
COMPUTE! **COMPUTE! Books** ***COMPUTE!'s GAZETTE***

Editorial Office:
324 West Wendover Ave., Suite 200, Greensboro, NC 27408

Corporate Offices:
825 7th Avenue, New York, NY 10019

Customer Service:
P.O. Box 5038, F.D.R. Station, New York, NY 10019
Telephone: 212-887-8525
Office Hours: 8:30 AM to 4:30 PM Monday–Friday

President James A. Casella
Vice President, Finance & Planning R. Steven Vetter

Subscription Orders

COMPUTE!'s GAZETTE
P.O. Box 10957, Des Moines, IA 50340

TOLL FREE
Subscription Order Line
1-800-247-5470
In IA 1-800-532-1272

COMPUTE!'s GAZETTE
Subscription Rates
(12 Issue Year): US (one year) $24. Canada, Mexico and Foreign Surface Mail $30. Foreign Air Mail $65.

The COMPUTE!'s GAZETTE subscriber list is made available to carefully screened organizations with a product or service which may be of interest to our readers. If you prefer not to receive such mailings, please send an exact copy of your subscription label to: COMPUTE!'s GAZETTE, P.O. Box 10958, Des Moines, IA 50950. Include a note indicating your preference to receive only your subscription.

Authors of manuscripts warrant that all materials submitted to COMPUTE!'s GAZETTE are original materials with full ownership rights resident in said authors. By submitting articles to COMPUTE!'s GAZETTE, authors acknowledge that such materials, upon acceptance for publication, become the exclusive property of **COMPUTE!** Publications, Inc. No portion of this magazine may be reproduced in any form without written permission from the publisher. Entire contents copyright © 1986 **COMPUTE!** Publications, Inc. Rights to programs developed and submitted by authors are explained in our author contract. Unsolicited materials not accepted for publication will be returned if author provides a self-addressed, stamped envelope. Where programs are included in an article submission, a tape or disk must accompany the submission. Printed listings are optional, but helpful. Articles should be furnished as typed copy (upper and lowercase, please) with double spacing. Each article page should bear the title of the article, date, and name of the author. **COMPUTE!** Publications, Inc., assumes no liability for errors in articles or advertisements. Opinions expressed by authors are not necessarily those of **COMPUTE!** Publications, Inc. **COMPUTE!** Publications assumes no responsibility for damages, delays, or failure of shipment in connection with authors' offer to make tape or disk copies of programs published herein.

PET, CBM, VIC-20, Commodore 64, Plus/4, 16, and 128 are trademarks of Commodore Business Machines, Inc., and/or Commodore Electronics Limited. Other than as an independent supplier of quality information and services to owners and users of Commodore products, **COMPUTE!** Publications, Inc., is in no way associated with Commodore Business Machines, Inc., or any of its subsidiaries.

Flight Simulator II Scenery Disks

The Challenge of Accomplished Flight

With a realism comparable to (and in some ways even surpassing) $100,000 aircraft flight simulators, Flight Simulator II includes full flight instrumentation and avionics, and provides a full-color out-the-window view. Instruments are arranged in the format standard to modern aircraft. All the radios needed for IFR flight are included. Front, rear, left, right, and diagonal views let you look in any direction. Program features are clearly documented in a 96-page Pilot's Operating Handbook.

For training in proper flight techniques, Flight Simulator II includes another 96-page instruction manual, compiled by two professional flight instructors with over 8,000 hours flight time and 12,000 hours of aviation teaching experience. You'll learn correct FAA-recommended flight procedures, from basic aircraft control through instrument approaches. To reward your accomplishments, the manual even includes a section on aerobatic maneuvers.

The Realism and Beauty of Flight

Go sight-seeing over detailed, realistic United States scenery. High-speed graphic drivers provide an animated out-the-window view in either day, dusk, or night flying modes.

Flight Simulator II features over 80 airports in four different scenery areas: New York, Chicago, Seattle, and Los Angeles. Six additional Scenery Disks covering the entire Western half of the United States are now available in IBM and C64/128 disk formats.

Apple and Atari versions will be released soon. Each disk covers a geographical region of the country in detail, and is very reasonably priced.

The Pure Fun of "World War I Ace"

When you think you're ready, you can test your flying skills with the "World War I Ace" aerial battle game. This game sends you on a bombing run over heavily-defended enemy territory. Six enemy fighters will attempt to engage you in combat as soon as war is declared. Your aircraft can carry five bombs, and your machine guns are loaded with 100 rounds of ammunition.

See Your Dealer. Flight Simulator II is available on disk for the Apple II, Atari XL/XE, and Commodore 64/128 computers for $49.95. Scenery Disks for the C64 and IBM PC (Jet or Microsoft Flight Simulator) are $19.95 each. A complete Western U.S. Scenery six-disk set is also available for $99.95. For additional product or ordering information, call (800) 637-4983.

Apple II is a trademark of Apple Computer, Inc.
Atari XL and XE are trademarks of Atari Corp.
Commodore 64 and 128 are trademarks of Commodore Electronics Ltd.
IBM PC is a registered trademark of International Business Machines Corp.

subLOGIC Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

Order Line: (800) 637-4983
(except in Illinois, Alaska and Hawaii)

Do you have a question or a problem? Have you discovered something that could help other Commodore users? Do you have a comment about something you've read in COMPUTE!'s GAZETTE? We want to hear from you. Write to Gazette Feedback, COMPUTE!'s GAZETTE, P.O. Box 5406, Greensboro, NC 27403. We regret that due to the volume of mail received, we cannot respond individually to programming questions.

Taking The Plunge

I am definitely going to buy a computer, but I know nothing about them. I would be using it for a monthly newsletter, reports for my three teenagers, checkbook balancing, and recipe filing. In my job at the Board of Education, I maintain lists of students who get free and reduced lunches. It would certainly save time if additions and deletions could be handled by the computer.

I had planned to buy a 64, but now there is the 128, and a friend advised me to wait for a new one that is a big improvement. Which computer should I buy?

Eleanore Palmison

We can't recommend one computer over another because there's no single "best" computer; each has advantages and drawbacks. But we can offer some suggestions for the first-time computer buyer.

Many experts advise shopping for software first. When you find a program that does what you want, buy the computer that can run it.

If you decide to look at software first, there are three general types of programs you'll want to look at: word processors, spreadsheets, and database managers. A word processing program manipulates text; it could be used for writing a newsletter or for your children's school reports. A spreadsheet manipulates numbers, which makes it suitable for balancing a checkbook or keeping track of a budget. A database management program manipulates information (a base of data), so it could be used to store your recipe file.

Any one of these three types of software could handle the list of students who receive reduced lunches, depending on what you need to do with the list. A word processor would be fine for adding and subtracting names and printing the final list. If you track lunches week by week to figure out percentages and budget numbers, you could use a spreadsheet. Finally, a database manager would be the right choice for alphabetizing names or calculating how many lunches are served in each school.

Consider also the age of the computer. A brand new computer might be very powerful, but you might have to wait some time for software to become available, perhaps a few months, perhaps a year or more. On the other hand, once a company has discontinued manufacturing a line of computers, software companies become reluctant to develop new programs. Often you'll see a new computer with little software available now, but much planned for the future. Mature computers are just the opposite: much software available now, but almost no new software planned for the future. The 128 is a curious mix of old and new: There's a lot of software for its CP/M and 64 modes, but very little for the 128 mode. You can expect to see more 128 software in the future.

Compatibility may be a factor in your decision about which computer to buy. If you use an IBM at work, there's a lot to be said for buying a computer that can read IBM disks if you think you might be bringing work home. On the other hand, if your children use Commodores at school, Commodore-compatibility would be a key consideration.

For many new buyers, price is important. Compare the cost of a system. If you plan to do word processing, remember that you'll need not only a computer, but a television or monitor, disk drive, and printer (and possibly an interface for the printer). Of the computers you're considering, the 64 is the least expensive, with the 128 costing slightly more.

Finally, talk to friends and relatives who own a computer. They should be able to provide suggestions and advice.

Escape From Lockup

I have found a way to get out of a locked up program with a Commodore 16 or Plus/4 without erasing the contents of memory. Hold down the RUN/STOP key while pressing and releasing the reset button. You will then be in the machine language monitor. Press X (for eXit) and type LIST to see that your program is still there. It's that simple!

Troy Pladson

Readers with a Plus/4, 16, or 128 can take advantage of this reset sequence, but VIC and 64 owners cannot (they have neither a reset button nor a built-in monitor). Another option on the 128 is to hold down the Commodore logo key, right below RUN/STOP, while the computer is being reset. This puts you directly into 64 mode.

128 Resets, Unnews, And POKEs

I'm mixed up about the terms "warm start" and "cold start." The Radio Shack Color Computer has a black reset button which unlocks the computer following a lockup while retaining the program in memory. I was under the impression that this is a warm start.

Commodore also has a reset button on the side of the 128. But if you press it, the entire system resets, erasing everything in memory. Why does this warm start erase the program while the other doesn't?

Also, in the May 1985 issue, you provided a list of POKEs for the 64, VIC, Plus/4, and 16 to disable certain commands or keys. Do you have the equivalent values for the 128?

Sean Conley

Technically, "cold start" is a complete reset of the computer while "warm start" is partial reset, a way to recover from a lockup without losing the program in memory. In practice, you'll often find these terms used interchangeably.

Turning the computer off and on performs the most extreme cold start, one in which all programs and variables are lost. On the 128, there are other means of resetting the computer (see the previous letter). If you press the reset switch by itself, the BASIC program is NEWed, and the 128 checks for a boot program on the disk. If a bootable disk is in the drive, it loads and runs; if not, you're left in BASIC.

There is a way to recover your BASIC program at this point. If it's a 128 BASIC program, type in the following line to UNNEW the program:

```
BANK 15:POKE(PEEK(45) + PEEK(46)
*256),1:SYS 24293
```

This line will not work correctly if you had previously allocated a hi-res

EPYX PRESENTS LUCASFILM GAMES™ THE EIDOLON™

You've just discovered the Eidolon—a curious 19th century machine whose inventor vanished without a trace. Only his journals and sketches remain. They tell of an incredible magical realm—a maze of caverns populated by strange creatures noted as Greps, Biter Birds and Bottlenecks. And "intelligent" Guardian Dragons—who hurl colored fireballs of energy?

The machine itself belies its quaint Victorian charm. For the Eidolon glows with the power of enchanted energy. It awaits, pristine and gleaming—perfectly preserved for over a hundred years by the powerful forces that propelled it and its pilot to another dimension.

With the fascinating first-person point of view, you can climb into the pilot's chair and fly this mysterious magical machine. And the haunting fractal graphics take you deeper and deeper into an endless maze of mystical caverns.

An adventure so real, it'll make you wonder: What ever happened to the Eidolon's mysterious inventor? Only the adventurous of spirit will know his fate. The Eidolon—scientific curiosity, or passport to a magical dimension?

	C64/128	ATARI	APPLE
The Eidolon	✓	✓	✓

© 1985 LFL.

* See specially marked boxes for details. No purchase necessary. Sweepstakes ends Dec. 31, 1985. Official rules available at participating dealers.

EPYX® COMPUTER SOFTWARE

1043 Kiel Ct., Sunnyvale, CA 94089

Strategy Games for the Action-Game Player®

Lucasfilm Games, The Eidolon, and all elements of the game fantasy: TM & © 1985 Lucasfilm Ltd. (LFL). All Rights Reserved. Epyx, Inc., Authorized User. ®: Registered Trademarks of Epyx, Inc.

graphics area. If you had been working with hi-res graphics, type **GRAPHIC 1:GRAPHIC 0** *before entering the POKE and SYS above.*

If you were working on a program in 64 mode, hold down the Commodore key while pressing the reset button. To recover the program, type:

POKE 2050,1:SYS 42291:POKE 45,PEEK (34):POKE 46,PEEK(35):CLR

Holding down the RUN/STOP key while pressing the reset switch is yet another type of reset. The machine is "unlocked" and you're left in the machine language monitor. Type X to exit to BASIC. Your 128 BASIC program remains intact.

In addition to these hardware techniques, you can reset the 128 by typing SYS 65341 (comparable to 64738 on the 64 and 64802 on the VIC). This SYS accesses a ROM routine which leaves you in BASIC and NEWs out the BASIC program. The techniques above will allow you to recover the program that was in memory.

Finally, the least destructive method of (partially) resetting the machine is to hold down the RUN/STOP key and press RESTORE. This allows you to recover from minor lockups without destroying your program or its variables.

Here are the POKEs you requested for the 128:

Disable LIST	**POKE 775,139**
Enable	**POKE 775,81**
Disable SAVE	**POKE 818,180**
Enable	**POKE 818,78**
Disable LOAD	**POKE 816,0**
Enable	**POKE 816,108**
Disable RUN/STOP	**POKE 808,100**
Enable	**POKE 808,110**
Disable RESTORE	**POKE 792,125**
Enable	**POKE 792,64**
Disable keyboard	**POKE 2592,0**
Enable	**POKE 2592,10**
No keys repeat	**POKE 2594,64**
All keys repeat	**POKE 2594,255**
Some keys repeat (space bar, INST/DEL, cursor keys)	**POKE 2594,0**
Clear keyboard buffer (before INPUT)	**POKE 208,0**
Change character color (numbers 0–15 correspond to colors 1–16)	**POKE 241,x**
Remove line numbers from LIST	**POKE 24,37**
Enable line numbers	**POKE 24,27**

Slower Listings

First, how do you slow down the listing of a long program? Second, I've been trying to convert some Apple programs to the 64, with limited success. How do you translate lines containing PEEKs and POKEs?

Richard K. Forsyth

On a VIC or 64, you can slow a listing to the screen by holding down the CTRL key. Press STOP to stop the listing altogether. To restart, you'll have to enter LIST again. There are utilities available to temporarily freeze the listing (SHIFT–LOCK does this in "MetaBASIC," which was published in the April 1985 issue of COMPUTE!'s GAZETTE). Some utilities even allow you to scroll forward and backward through the listing.

To achieve the same effect on a Plus/4, 16, or 128, hold down the Commodore key in the lower lefthand corner. These machines permit the use of CTRL-Q and CTRL-S to temporarily freeze and unfreeze the listing. The 128 also has a NO SCROLL key for pausing output to the screen.

Your second question is a little more difficult. Translating programs from one machine to another requires a good knowledge of both operating systems. Fortunately, there are many similarities in various dialects of BASIC. For example, FOR-NEXT loops are basically the same on most computers.

But PEEK and POKE are machine-level commands. You need to find out what the PEEK or POKE does on the Apple. Does it check to see if a key is pressed? Does it change the screen color? Once you know how it functions, you can figure out the equivalent on the 64. A memory map is almost a necessity when you're trying to convert POKEs. See "Machine Language For Beginners" elsewhere in this issue for more about memory maps.

Keys With No Character

I've been trying without success to read the SHIFT, CTRL, Commodore, and RESTORE keys. Can you help?

Juan Pablo Vicente

If you're using GET or INPUT, you won't be able to tell if any of those four keys is pressed. Here's why:

Most keys put printable letters or numbers on the screen. Others do something to the screen—clear it, change the cursor to a new color, move right a character, delete a character, and so on. Each character has its own ASCII number and a shape that can be displayed on a screen or printer. Control codes also have ASCII numbers and, while they're not printable, they have a visible effect on the screen.

But the SHIFT, CTRL, and Commodore keys have neither ASCII values nor character shapes. They're almost never used alone; they're usually held down while another key is pressed. In uppercase/graphics mode, typing a SHIFT-S prints a heart character, Commodore-S prints a corner graphic, and CTRL-S homes the cursor. Each regular key can have up to four definitions, depending on whether these three keys are up or down.

Although you can't use GET or INPUT for these three keys, there is a way to read them. Try the following one-line program (for VIC and 64):

10 PRINT PEEK(653):GOTO 10

Your letter didn't say which computer you own, but if you own a Plus/4 or 16, substitute 1347 for 653 in the program above. Commodore 128 owners using 128 mode should PEEK location 211. The numbers printed on the screen have the following meanings:

0	*No shift key*
1	*SHIFT*
2	*Commodore*
4	*CTRL*

If more than one key is down, the numbers will be added together. Thus, pressing both SHIFT and CTRL will return a value of 5 (1 + 4). In addition, the 128 returns a value of 8 for the ALT key, and 16 for CAPS LOCK.

The RESTORE key is another matter. It's directly wired into one of the interface chips. Pressing it triggers an interrupt which, among other things, checks for the RUN/STOP key. Reading the RESTORE key is not impossible, but it's not a matter of a PEEK or two. You'd need a machine language wedge to intercept the interrupt-handling routine.

Our Readers Are Writers

I'm writing a program for my VIC and 64 and would like to sell it to your magazine. What do I have to do?

Patrice Côté

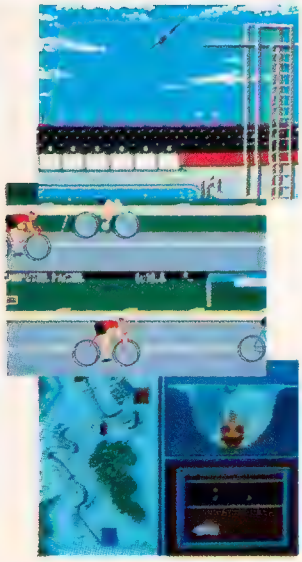
Many of our programs are written by our readers. Elsewhere in this issue is the "COMPUTE's Gazette Author's Guide," which includes guidelines for submitting programs. Also, individual copies of the Author's Guide are available on request. (Please include a self-addressed stamped envelope.)

The two most important things to include are a disk (or tape) containing the program and instructions on what it does. Submissions are reviewed carefully by several staff members. If we decide we'd like to publish it, we send a contract to the author. If the author agrees to the price, he signs and returns the contract. Sometimes we do not accept what are often excellent programs, however. This can happen for several reasons: The program may be too long to publish, it may be too similar to an article we have scheduled for an upcoming issue, or it may be inappropriate for our audience. We welcome all submissions from readers, and wish to emphasize again that every program submitted is carefully reviewed.

For Numbers Only

I have a program that uses two arrays and saves the data in them to disk. About half the time, when I read the

22 FAST-PACED, EXCITING EVENTS. GO FOR THE GOLD!



SUMMER GAMES.®
Want some great play action? This award winning best seller brings you eight great events, including Swimming, Diving, Track, Gymnastics, and more. Compete against world records. Or get together with a group of up to eight for some good competitive *fun*. Realistic, graphics and *action* will challenge you again and again to *go for the gold*.

SUMMER GAMES II.™
You asked us for more great events. Here they are. Rowing, Triple Jump, Javelin, High Jump, Fencing, Cycling, Kayaking, even Equestrian. Like SUMMER GAMES, you get spine tingling *action and challenge* for one to eight players. These aren't just games. They're *the games*. And you're the star.

WINTER GAMES.™
You've got to see the graphics, and *feel* the knot in your stomach as your bobsled careens along the walls of the run to know why people are wild over WINTER GAMES. Seven events give you a variety of action—from the endurance of the Biathlon to the timing of the Ski Jump, and more.

What are you waiting for?
Play your favorite events over and over. Play all 22. Set up teams. Challenge your friends. These great action-strategy games are sure to be the stars of *your* collection.

At your local Epyx dealer.

	APPLE	MAC	ATARI	C64/128
Summer Games	✓		✓	✓
Summer Games II	✓			✓
Winter Games	✓	✓		✓

* See specially marked boxes for details. No purchase necessary. Sweepstakes ends Dec. 31, 1985. Official rules available at participating dealers.

EPYX® COMPUTER SOFTWARE
1043 Kiel Ct., Sunnyvale, CA 94089

Strategy Games for the Action-Game Player®

file, I get a FILE DATA error. The program works fine until I save and reload the data. Is there a way to avoid this problem?

Ron McAdow

You didn't include a copy of your program, so we can only guess where your problem may lie. It's likely that your program is trying to read numeric data but is receiving strings—alphanumeric characters—instead. The FILE DATA error which you encountered is equivalent to the REDO FROM START error which occurs during keyboard input. We can easily trigger this error. First, type in the following one-line BASIC program:

10 INPUT A

Here, variable A is used to store a number and thus is known as a numeric variable. For inputting character string data, you'd have to change A to A$ (the dollar sign designates the variable as a string type).

Type RUN. When prompted by the question mark (which means the computer is waiting for input), type in some character other than a number. Press RETURN and a REDO FROM START error message will be displayed on the screen.

The same restriction regarding data types applies when inputting data from the disk. For instance, the statement **10 INPUT#1,A** *attempts to read numeric information from file number 1 (assuming you opened file one to a disk file). If the file contains string data instead of numbers, a FILE DATA error results. The program asks the file for numeric information, but gets non-numeric characters instead.*

So, to fix your problem, check the data output and input routines. Make sure that the types of data accessed are in parallel between these two routines. In other words, data saved as numeric data to the disk should only be loaded back in as numeric data. The same should be true of any string data.

Also, you noted that you were using the save-with-replace command to save over files with the same name. This routine is known to contain bugs on the 1541 (it is uncertain whether this error affects the newer 1571 as well). It is preferable to scratch the old data file before saving another one by the same name.

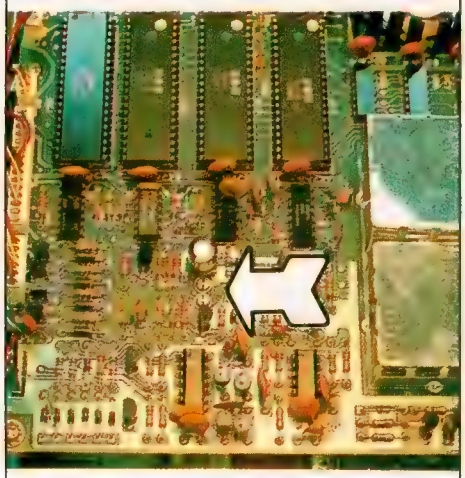
Disk Device Numbers

I've tried to change the device number of a 1541 drive by the hardware method in the User's Manual, but I can't find the device number jumpers.

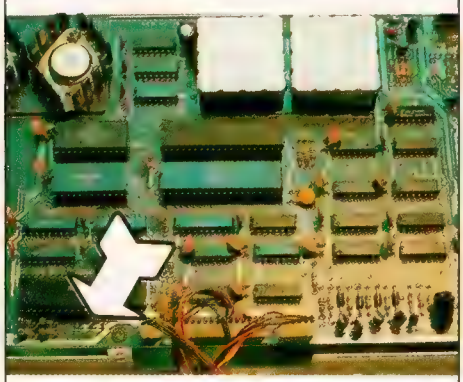
Isao Sakata

First unplug your disk drive and open it by removing the screws on the bottom. You may also have to remove a perforated metal shield. Look for two circular areas. Each is divided in half, with the two halves connected by a thin piece of solder.

You can find the jumpers near the center of the circuit board, near the front. Your disk drive should look like this if it has a tan case (the same color as the 64):



If you have an older 1541 with the white case, the color of a VIC-20, the jumpers are on the left edge:



In both drives, jumper 1 is nearest to the front of the drive. Jumper 2 is towards the rear. To change the device number, cut the solder traces as follows:

Jumper 1	*Jumper 2*	*Device Number*
whole	*whole*	*8*
cut	*whole*	*9*
whole	*cut*	*10*
cut	*cut*	*11*

Take a sharp object and scrape away the solder that connects the two halves. Do this very carefully, to avoid damaging the circuit board.

Some of our readers have replaced the solder traces with switches, so the device number can be easily changed. We don't recommend doing this unless you're good with a soldering iron.

Copying Tape Files To Disk

I have a tape-based address file program that uses sequential text files. I now have a disk drive and would like to know if there is a routine that would copy the tape file to disk.

Robby Obendorf

The following program will do the job. Wind the tape to just before the beginning of the file you want to copy then put a disk with enough room to hold the file into the disk drive. Now run the copy program. It will ask you to press play on tape, then after the file is done copying, the message DONE appears on the screen.

```
10 INPUT"{CLR}{3 DOWN}FILENAME
   ";N$
20 OPEN 1,1,0,N$:OPEN 2,8,2,N$
   +",S,W"
30 GET#1,A$:IFST=64THENCLOSE2:
   CLOSE1:PRINT"{CLR}
   {3 DOWN}DONE":END
40 PRINT#2,A$;:GOTO30
```

The program is very simple. Line 10 inputs the name of the file you want to copy. In line 20, a file is opened to read from tape and another is opened to write to disk.

Line 30 gets characters until the reserved variable ST is equal to 64. ST is a reserved system variable that changes values depending on certain conditions. The variable ST is set to 64 when the end of file is reached. Once this happens, the files are both closed and the program ends. Line 40 outputs the character received from tape to the disk drive.

Undimension For 128

The April 1985 "Hints & Tips" describes a useful procedure for "undimensioning" arrays without affecting other variables. POKE 49,PEEK(47): POKE 50,PEEK(48) does it on the 64. Can you tell us the equivalent POKEs for the 128?

R.L. Clark

Many computers, including the Commodore 64 and 128, use a series of memory locations (usually in zero page) to keep track of the location of beginning and ending addresses for BASIC text, variables, and strings. For example, locations 43–44 (45–46 for the 128) hold the address of the start of BASIC text in low-byte, high-byte format.

Here's a list of some of the important zero-page pointers in the Commodore 64 and 128:

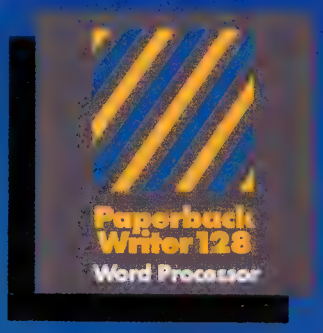
Function	*Commodore 64*	*Commodore 128*
Beginning of BASIC text	*43–44*	*45–46*
End of BASIC text	*45–46*	*4624–4625*
Start of variables	*45–46*	*47–48*
Start of arrays/End of variables	*47–48*	*49–50*
End of arrays (+1)	*49–50*	*51–52*
Bottom of string storage	*51–52*	*53–54*

On the 64, free memory is any address between end of arrays and the bottom of string storage. That section—in bank one—is free on the 128, which also has free memory above the end of BASIC text. (Programs and variables must share memory on the 64, but they have their own banks of memory on the 128.)

One way to redimension an array is

Solutions!

PW 128/64 Dictionary also available at $14.95 (U.S.)



Best-selling software for Your Commodore 128 or 64

You want the very best software you can find for your Commodore 128 or 64, right?

You want integrated software — word processing, database and spreadsheet applications — at a sensible price. But, you also want top-of-the-line features. Well, our Paperback 128/64 software goes one better.

With Paperback 128 or 64, you'll find all the features you can imagine . . . and then some. And Paperback 128/64 is so easy to use, you won't even need the reference guide. On-screen and in memory instructions will have you up and running in less than 30 minutes, even if you've never used a computer before.

The price? It's as low as you'd expect for a line of software called 'Paperback'. Suggested Retail Price for the 64 Software is $39.95 (U.S.) and $49.95 (U.S.) for the 128. Any of the 64 products may be upgraded to their 128 version for $15.00 (U.S.) + $3.00 shipping and handling. (Available to registered owners from Digital Solutions Inc. only.)

Paperback Writer 128 or 64, Paperback Planner 128 or 64 and Paperback Filer 128 or 64 . . . **Solutions** at sensible prices from Digital Solutions Inc.

International & Distributor enquiries to:

MAIL ORDERS:

CRYSTAL COMPUTER INC.
In Michigan 1-517-224-7667
Outside Michigan 1-800-245-7316
24 hours a day, 7 days a week.

U.S. DEALER ENQUIRIES:

ALLEGRO TECH
1-800-544-1004
In Massachusetts
1-413-443-9443

MICRO-PACE COMPUTERS INC.
1-800-362-9653
In Illinois
1-217-356-1884

MICRO-SYS DISTRIBUTORS
1-800-527-1738
In Texas
1-214-231-2645

CANADIAN DEALER ENQUIRIES:

FRANKLIN WINTER
Consulting & Sales
1-416-822-5974

Serious software that's simple to use.

Digital Solutions Inc.

P.O. Box 345, Station A
Willowdale, Ontario
Canada M2N 5S9
1-416-221-3225

Paperback Writer 128 and 64 are now available in French.

to use the CLR command. This command sets all the variable pointers to the end of BASIC text. Although this does not actually erase the variables in memory, they can no longer be read. The CLR command clears all variable types.

The technique you mentioned (for the 64) clears out arrays only by moving the value in the start of arrays pointer into the end of arrays pointer. The following program for the 128 uses this same technique to redimension an array while retaining the value of other variables.

```
10 DIM A(10):C=4
20 POKE 51,PEEK(49):POKE 52,PE
     EK(50)
30 DIM A(10):PRINT C
```

Commodore Modems And Compatibility

Will my VICModem, which I did not use at all with my VIC-20, work with my 64?

Richard Gray

Yes and no. A modem by itself is just an input/output device. It's as compatible as a joystick—if a joystick works on the VIC, it will work on a 64, but you must PEEK different locations to read it.

You can plug the VICModem into your 64, but software is required to send and receive characters. The hardware (the modem) is compatible, but a VIC terminal program probably won't run on your 64, unless it's a very simple BASIC program. You should have received a tape or disk with the modem. On it, you'll find one terminal program for the VIC and one for the 64. If you have the right software, the modem will work with your 64.

The VICModem and the 1650 Automodem are not compatible with the Plus/4, although the 1660 does work with that computer. Modems do not work with the 16; it lacks an RS-232 port. And all of the above-mentioned modems can be used on the 128.

Reading The Second And Third Clocks

I've tried and tried to use the two Time Of Day (TOD) clocks on the 64, but have had no luck whatsoever. I know these are the locations:

56328—tenths of seconds
56329—seconds
56330—minutes
56331—hours (AM/PM is bit seven)

56584—tenths of seconds
56585—seconds
56586—minutes
56587—hours (AM/PM is bit seven)

I know they run in BCD and from what I hear, it stops updating the memory locations but keeps counting until you pull the values out.

Jim Cooper

With PRINT TI or PRINT TI$, you can read the jiffy clock from BASIC. The two TOD clocks are a little more difficult to use, but they're more reliable over the long run because the jiffy clock is sometimes thrown off by tape or disk access. To use the TOD clocks, you first have to learn something about how BCD (Binary Coded Decimal) works. There is also one rule for PEEKing and POKEing properly.

BCD is a special way of counting. In a way it's a compromise between decimal and hexadecimal. If you PEEKed a BCD counter as it increased in value from 1 to 25, you would see the following values:

1, 2, 3, 4, 5, 6, 7, 8, 9, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 32, 33, 34, 35, 36, 37

It doesn't seem to make much sense until you look at the hexadecimal values. These are the same numbers as above, but they've been translated into hex:

$01, $02, $03, $04, $05, $06, $07, $08, $09, $10, $11, $12, $13, $14, $15, $16, $17, $18, $19, $20, $21, $22, $23, $24, $25

The pattern should be clear. After nine, you skip ahead to 16, because 16 has a hex value of $10. To convert an ordinary decimal to BCD, multiply the number in the tens' place by 16 and add the digit in the ones' place. To regain the decimal value, take the number in the sixteens' place and multiply by ten (the math would be 10(B AND 240)/16). To this number, add the digit in the ones' place (B AND 15).*

So if you PEEK the hours' byte of a Time Of Day clock and get a value of 16, the time is 10:00. If you PEEK the minutes byte and find a 66, it means 42 minutes—decimal 66 is hex $42, so 66 really means 42. After a time, you get used to the conversions.

The rule about PEEKing and POKEing is simple: Always start at the hours byte and end at the tenths byte. So a FOR-NEXT loop must count backwards, using a STEP value of −1. PEEKing or POKEing the hours, minutes, or seconds stops the clock. Actually, the clock keeps running, but the values for PEEKing or POKEing are temporarily frozen. There's a good reason for this. Let's say the time is 7:59:59.9. You PEEK the hours byte and find a seven. If the clock kept going, by the time you PEEKed the minutes value, it might be 8:00, so you'd see a zero. You would incorrectly calculate the time to be 7:00, instead of 8:00. To prevent this problem, the clock stops updating as soon as you PEEK or POKE, and it doesn't start up again until you do something with the tenths register.

Greater-Than In Machine Language

I would like to know how to perform greater-than and less-than operations in machine language. For example, what is the equivalent of the BASIC line **10 IF X<24 THEN X=24**?

David Cardin

Machine language has three "compare" operations which can be used to check the relative size of two numbers. The ML instructions are CMP (compare the number in the accumulator to another number), CPX (compare the X register to a number), and CPY (compare the Y register). Each has several addressing modes, which are listed in the Programmer's Reference Guide.

To understand how a compare works, you have to know a little about adding and subtracting. Consider a simple sum such as 4 + 8. The result (in decimal) is 12, but you don't always write down the two digits "12." If there are several columns to be summed, you write a two and "carry the one" to the top of the next column, to be added to the numbers there. Machine language addition follows the same procedure. The computer's carry flag can either be on (set) or off (cleared); it operates like a ninth bit for eight-bit addition.

To add two numbers takes three steps: Clear the carry flag (CLC), load the accumulator with the first number (LDA), and then add-with-carry (ADC). The result of the addition will be found in the accumulator. If the answer is between 0 and 255, the carry remains clear. Otherwise, the carry is set. For example, 250 + 9 would set the carry and return a value of 3, while 20 + 30 would result in 50 (and nothing would be carried).

To subtract, you first set the carry (SEC), then load a number into the accumulator (LDA) and subtract-with-carry (SBC). If the carry is still set after the subtraction, then the first number was equal to or greater than the number subtracted. In other words, if the carry is set, the result was a positive number (or zero). But when the carry is clear after SBC, it means the second number was larger and the result would be a negative number.

A compare operation is just like a subtraction in the way the carry flag is affected. The following routine illustrates how to compare a number to 24:

```
033C LDA $C900;  PUT NUMBER FROM
                 MEMORY INTO .A
033F CMP #$18;   COMPARE TO
                 DECIMAL 24
0341 BCS $0348;  BRANCH IF CARRY
                 SET (>= 24)
0343 LDA #$18;   CARRY CLEAR, SO
                 LOAD 24 INTO .A
0345 STA $C900;  AND STORE IT AT
                 $C900
0348 RTS;        RETURN FROM
                 SUBROUTINE
```

The number in $C900 will always be in the range 0–255. If it's greater than or equal to 24, the CMP at 033F will leave the carry set. CMP #$18 is like subtracting 24 but it does not alter the value in the accumulator. So, if the carry is set, the BCS at $0341 jumps ahead to the RTS, with the accumulator still holding the value from location $C900. Otherwise, we put a 24 into $C900.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 7480 DES MOINES, IOWA

Postage Will Be Paid By Addressee

COMPUTE!'s
GAZETTE
DISK
PO BOX 10960
DES MOINES, IOWA 50347

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

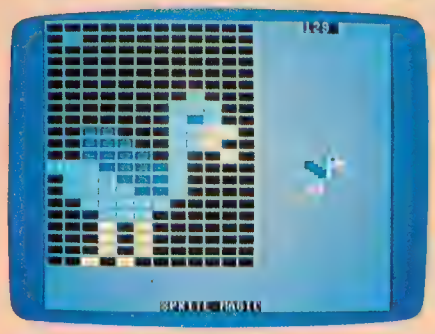
FIRST CLASS PERMIT NO. 7480 DES MOINES, IOWA

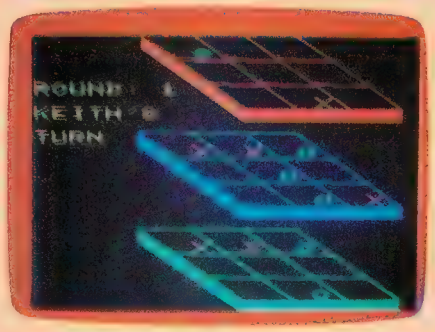
Postage Will Be Paid By Addressee

COMPUTE!'s
GAZETTE
DISK
PO BOX 10960
DES MOINES, IOWA 50347

BUILT FOR SPEED

Now Get Inside Your Commodore with *COMPUTE!'s Gazette Disk.*





Now there's a way to get all the exciting, fun-filled programs of ***COMPUTE!'s Gazette***—already on disk—with ***COMPUTE!'s Gazette Disk***.

Subscribe today, and month after month you'll get a new, fully-tested 5¼-inch floppy disk guaranteed to run on your Commodore 64, Commodore 128, or VIC-20 personal computer.

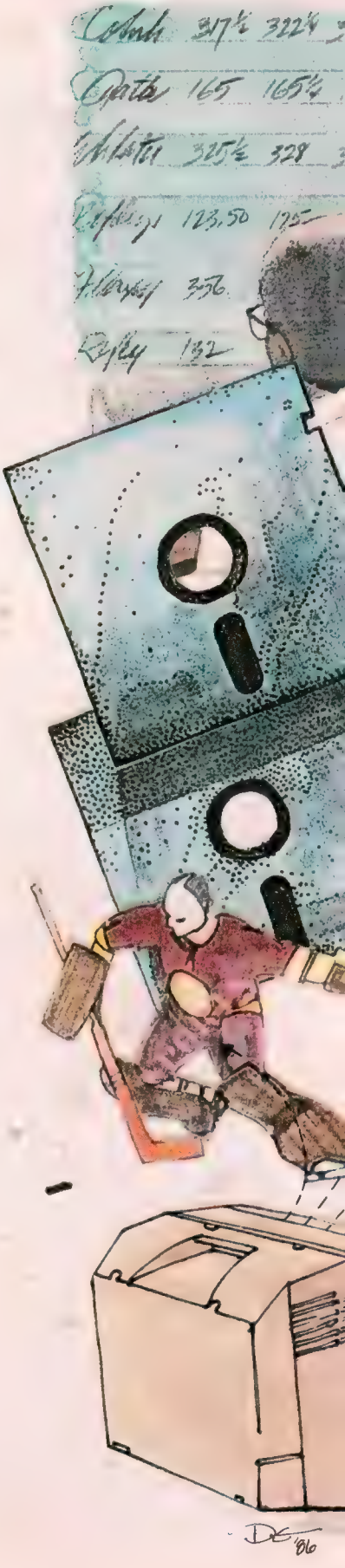
COMPUTE!'s Gazette Disk brings you all the latest, most challenging, most fascinating programs published in the corresponding issue of ***COMPUTE!'s Gazette***. So instead of spending hours typing in each program, now all you do is insert the disk...and your programs load in seconds.

RESULT: You have hours more time to enjoy all those great programs which appear in ***COMPUTE!'s Gazette***—programs like Number Quest, Address File, Treasure Hunt, Castle Dungeon, Vocab Builder, SpeedScript, and hundreds of others.

So don't waste another moment. Subscribe today to ***COMPUTE!'s Gazette Disk*** at this money-saving price. Take a full year's subscription for just $69.95. You save 55 percent off the single issue price. Subscribe for two years and save even more! Return the enclosed card or call toll-free 1-800-247-5470 now (in Iowa call 1-800-532-1272).

Individual issues of the *Disk* are available for $12.95 (plus $2.00 shipping and handling) by calling 1-800-346-6767 (in NY 1-212-887-8525).

What's New ONLINE For Commodore



Kathy Yakal, Assistant Features Editor

If you've held off on buying a modem because you've heard horror stories about two-hundred dollar phone bills, you might want to reconsider. In most cases, a local phone call can connect you to one of many different online information services, some of which have been designed especially for Commodore owners. If you're not in touch with what's online, you're in for a pleasant surprise.

It's an unusual computer owner who doesn't like to swap information with other computer owners. Even if you don't have problems with, or questions about, your machine, you probably just like to know who else is out there and how they're using their computers. User groups and electronic bulletin board systems do a good job of providing this kind of support and information, but they're usually limited to people in a specific geographical area.

Nationwide networks, in the form of online information services, provide a wider outlet for sharing information. Services that have been around for a long time, like CompuServe, offer special interest areas within their vast databases, areas where machine-specific information can be shared.

Until recently, the Commodore Special Interest Group (SIG) on CompuServe was probably the most widely-recognized national clearinghouse for Commodore information. Some of the most knowledgable Commodore supporters around the country served as system operators (*sysops*), and Commodore engineers were accessible to answer technical questions.

Several months ago, Commodore decided to start a telecommunications service of its own, and removed its prime support from CompuServe. The Commodore SIG there is now operated by the Toronto PET User Group (TPUG), although Commodore employees still provide technical support. And many of the old CompuServe sysops are managing SIGs on some promising new online information services.

It's a very interesting time for Commodore owners in this early stage of telecommunications. You have your choice of a number of different services, many of which are just starting out, and each of which has its own personality. The best Commodore resources are available in a variety of different formats and price ranges.

Shopping for an online information service is not unlike shopping for a personal computer. When you were deciding which computer to buy, you

It's a very interesting time for Commodore users in this early stage of telecommunications. You have your choice of a number of different services... each of which has its own personality.

probably asked friends for advice. You considered how much money you were willing to invest. You may have read articles about different machines, and talked to salespeople in stores. Maybe you investigated the manufacturer's stability in the market. And after considering your reasons for buying a computer, checked to see if software was available for your individual needs.

Some of the same factors may apply if you're looking to join an online service. Unfortunately, you can't do a "test-drive" before deciding to join, but you can try out a service for a few months and quit if you don't enjoy it. Descriptions of many of the services sound similar, though they are actually quite different when you get online. The flavor of each service is strongly affected by the people who run it and the users who contribute to it.

Let's take a look at some of the common features these services share before getting into specifics for each.

Access Numbers. Some major networks, like CompuServe, have dedicated phone lines in many cities that you can call to log on. In other cases, you may have to call one of the packet-switched networks (also a local number) like Tymnet or Uninet. Customer service people at the network you're interested in can give you the best phone number for your geographical area. The advantage to calling a local number is that you don't have to pay extra for long-distance charges. If there's a charge for connecting, it's usually very reasonable, a few dollars per hour.

Sign-On Procedures. This varies, but generally you'll have to spend a few minutes online going through a registration process. You'll be asked for your name and address, your billing preference (most accept major credit cards and direct checking account withdrawal), and, in some cases, what kind of equipment you're using and your local access phone number. Services that require a specific terminal program will then automatically log you on when you load the software (if you have an auto-dial modem).

Menu Structures. Most use a *branched menu* structure. You start at the top, the main menu, and choose which general area you want to enter. Once there, you'll work your way through a series of lower menus into more specific areas. To get back up to the top, to move around again, or sign off, you'll often have to work your way back again. Most systems have a very simple set of commands to let you get around. Once you're familiar with the system structure, you may find it quicker to go directly to your favorite sections. On CompuServe, for example, you can enter GO CBM to get to the Commodore area.

If you haven't already done so, learn how to use the downloading feature of your terminal program. Downloading means capturing information from the service and transferring it to your computer's memory, a printer, and/or your disk drive. If you can't download with the program you're using and plan to do a lot of telecommunicating, it's advisable to get a more sophisticated program. Every online service has extensive help files, and it's a good idea to download them the first time you get on, then print them out so you can refer to them until you're familiar with the system. Most people online are very willing to help a new user, but it saves everyone time and money if you learn on your own. If you do need to ask for help, keep your inquiries brief, or ask for directions to an area of the system where you can find answers.

Online Conferencing. Online services have become much more interactive. If you've ever called a BBS, you know you're usually the only person online at the time, unless the sysop has more than one phone line dedicated for the service. In the early days of online services, you knew that there were lots of other people on at the time, but couldn't communicate with them. Now, most services have at least a general conference area, like CompuServe's CB simulator. Some have special interest conference areas within different SIGs, making it easier to locate people who want to talk about what you want to talk about.

When you enter an online conference area, you may see a warning about the consequences of making offensive comments. Heed those warnings. At the very least, you'll offend somebody. You may even be logged off the system and asked not to return, or have to pay a fee to rejoin.

After you've entered, everyone who is online in that area will usually get a message announcing your presence. If you're a new user, people will probably welcome you to the system and may ask who you are. Try to keep your greetings brief. The unspoken protocol on these conference areas suggests that you return people's greeting and bid them farewell when you're going to leave, but five minutes of saying hello and good-bye to each other can run up everyone's phone bill.

Most systems provide a way for you to talk privately with another user. If you want to talk to someone else, you can page them. They'll be sent a message that you want to talk, and can either accept or decline.

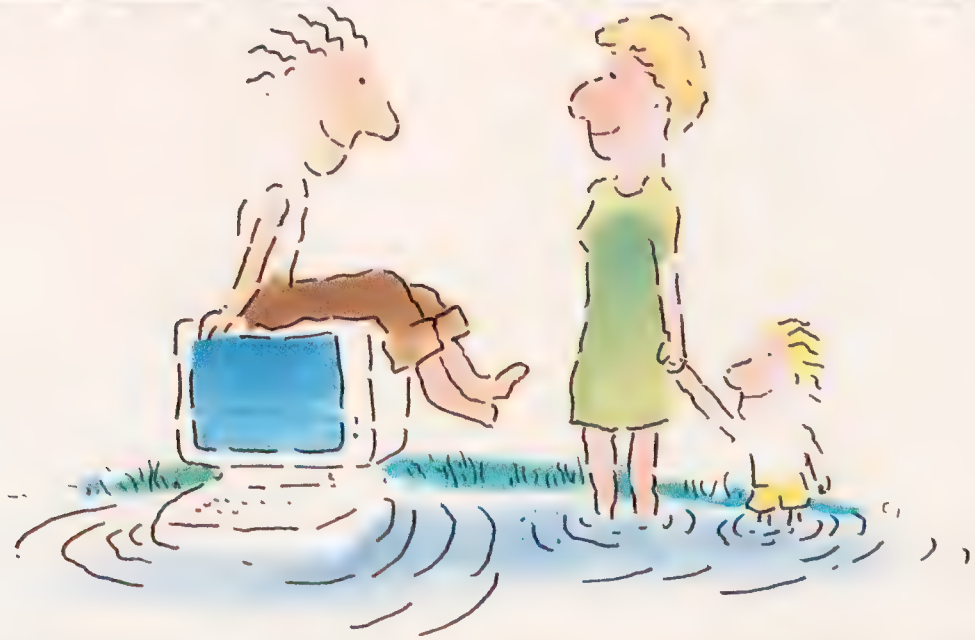
One more word of advice: Never give out your system password while in an online conference area.

Program Downloads. Another very popular area. Most online services have extensive libraries of public domain software that you can download and save to a formatted disk.

This is probably the most difficult area you'll encounter on online information services, though here again, reading and capturing the help files on downloading should answer all your questions. If you're not using a service-specific terminal program, you'll need to know what *protocols* your terminal program supports. Messages and documentation are generally uploaded and downloaded as ASCII files and are fairly easy to handle. But most programs are stored as binary files (sometimes called image files). Download protocols use different checksum methods to help ensure that what one computer sends is exactly, byte for byte, what the other computer receives, because if even one character is incorrect the program may not work. Be prepared for some down time here. Downloading programs can be time-consuming, especially if you're running at 300 baud.

Message Boards. Similar to those found on BBS's, these are areas where you can leave general-interest or specific questions for

GET YOUR FEET WET...



...IN THE INFORMATION AGE WITH THE DOW JONES NEWS/RETRIEVAL® MEMBERSHIP KIT. SAMPLE A CONTINUOUS STREAM OF KNOWLEDGE AT A PRICE YOU CAN AFFORD.

Now you and your whole family can experience the information age without getting in over your head.

For just $29.95, the new Dow Jones News/Retrieval Membership Kit leads you step-by-step into entertaining and informative data bases. With **five free hours** to sample and explore, you can find a fact, shop at home, get the scores, plan a trip, review a movie, choose a stock, or check world and business news. There's a lot more, too. All you need to get started is a computer and modem:

The Membership Kit is a big value that entitles you to:

- Your password ($75 value)
- Easy, step-by-step User's Guide
- FIVE FREE HOURS of usage to explore the magic of this comprehensive service
- A subscription to *Dowline*™, the magazine of Dow Jones Information Services

Get your feet wet in the information age with the Dow Jones News/Retrieval Membership Kit. At $29.95, you'll enjoy the dip without getting soaked. Available at computer retailers and selected bookstores. For the location nearest you, call:

1-800-257-5114

In New Jersey, Canada and Alaska 1-609-452-1511

"Free time" offer limited to five(5) hours per household. Must be used within 30 days of receipt of password. Nominal service fee still applies.

"Toss away any preconception that Dow Jones News/Retrieval is a stuffy, one dimensional data base service designed only for an elite corps of stock analysts and Wall Street wizards. Far from it—Dow Jones News/Retrieval also provides entertaining movie reviews, current weather and sports reports, convenient electronic shopping and inexpensive electronic mail. . .Dow Jones News/Retrieval is informative, entertaining and well worth the money."
-Brad Baldwin, *InfoWorld* Magazine

DOW JONES NEWS/RETRIEVAL®

© 1985 Dow Jones and Company, Inc.
All Rights Reserved. Dow Jones News/Retrieval® is a registered service mark of Dow Jones and Company, Inc.

New toll free number:
1-800-541-1541

KEYMASTER

The easiest-to-use, most-powerful disk backup program ever written for the 64.

With one 1541 drive:
- **FAST** FILE COPIER — up to 5 times faster!
- **FAST** full protected — disk GCR nibble copier
- **FAST** full unprotected — disk copier
- **KEYMASTER** protected — disk unlocking kit**
- **FAST** 10 second disk formatter

With two 1541 drives (NO disk swapping required during copying):
- **FAST** file copier — up to 6 times faster!
- **FAST** full protected — disk GCR nibble copier
- **FAST** full unprotected — disk copier

** **KEYMASTER** unlocks protected disks by **ELIMINATING** the protection scheme originally written on the disk.
** Once one of KEYMASTER's KEYS has unlocked a disk, the program can generally be **FILE COPIED** onto another disk (also making the program compatible with non-1541 drives). If it is not file copyable, it can be fast nibble copied.
** **50 KEYS** for popular programs will be provided on the first KEYMASTER disk.
** Frequent updates of 25 to 50 additional KEYS will be available (no original disk return required for updates!).

ALL OF THIS AT THE RIGHT PRICE! ONLY —

$29.95 for KEYMASTER
$10.00 for update disks

KEYMASTER created by Jim Drew.

New toll free number:
1-800-541-1541

MAGNUM LOAD BLOWS THE OTHERS AWAY!

ATTENTION 1541 AND MSD OWNERS!

- MAGNUM LOAD will LOAD and VERIFY programs up to **6 TIMES FASTER** than before. It is a new replacement KERNAL (operating system) ROM chip for your Commodore 64 or 128 computer.
- A high-speed loader, high-speed verify, disk drive no-head-rattle routine (1541 drive) and a BASIC UNNEW ROUTINE (MSD drive) have replaced the Datasette tape routines.
- The first program on a disk may be loaded and run by pressing only two keys (SHIFT/RUN).
- Unlike the older, cartridge-style fast loaders, no ports are tied up at the rear of your computer, the screen is not blanked during loading and there is no wear-and-tear on the game port.
- For maximum convenience and performance, MAGNUM LOAD is installed DIRECTLY in the circuit board. Generally, a socket has already been provided to make the operation easy, but occasionally some soldering may be required.
- Now you can give your 1541 disk drive "1571 speed."

The chart below compares ACTUAL MEASURED loading times.

PROGRAM	STAR DOS	REGULAR LOAD	MACH 5	FAST LOAD	MAGNUM LOAD
Pitstop II (EPYX)	?	144 sec	43 sec	41 sec	31 sec
Music Shop (BRODERBUND)	?	105 sec	105 sec*	105 sec*	21 sec
Hitchhiker's Guide to the Galaxy (INFOCOM)	?	70 sec	70 sec*	**	68 sec*
On-field Football (GAMESTAR)	?	159 sec	66 sec	63 sec	56 sec
EASY FINANCE I (COMMODORE)	?	58 sec	13 sec	13 sec	11 sec

* = Will not fast load — defaulted back to regular load.
** = *Failed to load at all.*

FIVE VERSIONS OF MAGNUM LOAD ARE AVAILABLE TO FIT ANY NEED.

VERSION	APPLICATION	PRICE
A	C64 computer and one 1541 drive	$24.95
B	C64 and one MSD drive (single or dual)	$24.95
C	C64, one 1541 drive AND one MSD drive (switchable)	$29.95
D	C128 computer and one 1541 drive***	$24.95
E	C128 and one MSD drive (single or dual)***	$24.95

*** = Fully compatible with 128 & CP/M modes. Cartridge versions MUST be UNPLUGGED to access 128 & CP/M modes!

ORDER THE VERSION YOU NEED NOW!

MAGNUM LOAD created by Jim Drew

C64, C128, 1541, 1571 and Datasette TM Commodore; MSD TM Micro Systems Development; MACH 5 TM ACCESS; FAST LOAD TM EPYX; STAR DOS TM Star Point

THE SHADOW $89.95

Shadow is a new and revolutionary piece of hardware that is used to duplicate even the most protected software. Fitting inside the disk drive (no soldering required), SHADOW takes complete control of all functions giving near 100% copies.

Being the best utility available today, it will even copy the other copy programs.

Because of the Shadow's unique abilities, we feel DOS protection is a thing of the past.

*HACKER PACKAGE $39.95

Shadow a disk while it loads, then read an exact list of:

- Track, sector, ID, check sum, drive status
- High and low track limits
- Density use on each track
- Half tracks that are used
- Command recorder shows commands that were sent to 1541 while program was loading
- RAM recorder records custom DOS

Shadow-scan any disk, then read exact list of:

- Valid tracks, half tracks, partial tracks and segments
- Sync mark link, header block links and data block links
- Track to track synchronization

Exclusive snap shot recorder will give you an exact copy of the 1541 RAM and can be viewed, saved or printed. Plus many more features included.

*Requires Shadow

*GT PACKAGE $44.95

Highly sophisticated and integrated piece of hardware that turns you 1541 into something you've always wanted.

- Track and sector display
- Drive reset switch
- Device number change
- Half track indicator
- Abnormal bit density indicator
- Shadow on-off indicator

The Shadow display will give you an accurate display of precisely what track you are accessing during a normal load even if the program does a read past track 35.

*Requires Shadow

Order by phone 24 hrs./7 days or send cashier's check/money order payable to Megasoft. Visa, MasterCard include card number and expiration date. Add $3.50 shipping/handling for continental U.S., $5.50 for UPS air. CODs add $7.50, Canada add $10.00. Other foreign orders add $15.00 and remit certified U.S. funds only. Distributors invited and supported.

MegaSoft LTD

P.O. Box 1080 • Battle Ground, Washington 98604
1-800-541-1541
Canadian/Foreign Orders Call
(206) 687-5205

other users. Even if you don't want to leave a message, it's interesting to just "cruise" these areas and see what people are talking about. You'll find experts answering questions from beginners, as well as programmers trading tips and techniques.

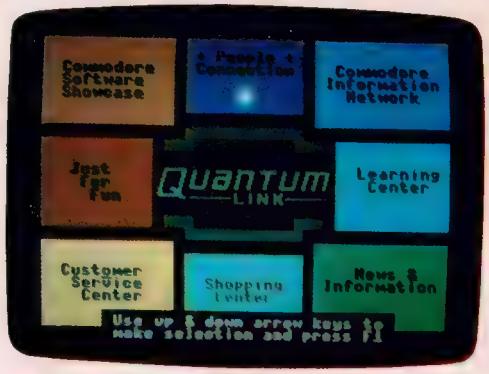
If you have questions about the system and can't find anyone to help, or just don't want to tie up someone online, you can leave messages here for the sysops. Most sysops respond quickly to user questions.

News from Commodore. Information about new products from Commodore, price changes, reports from trade shows, and other general news of interest to Commodore owners are posted in the message or bulletin areas of many services.

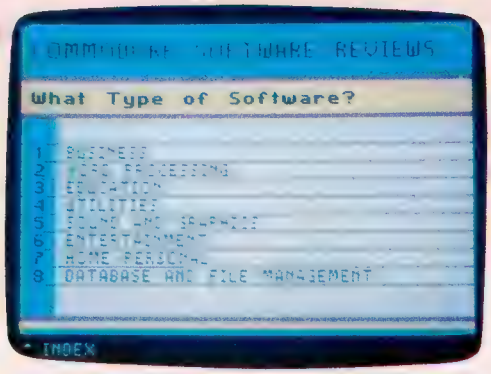
Telegames. Many services offer games that can be played with other people currently online. These range from traditional board and card games to the complicated fantasy/strategy game *MegaWars* on CompuServe.

Online Shopping. Though this application is still in its infancy, many services let you browse through "catalogs" of merchandise from which you can order while online.

News, Sports, and Weather Information. You might be able to catch something online before it hits the newspaper here, though it's usually faster and cheaper to get this kind of information from a print publication. However, if you live in a rural area without easy access to a timely newspaper or a television station, you might find this feature extremely useful.



QuantumLink's main menu takes advantage of the color graphics capability of the Commodore 64.



Viewtron features reviews of many different kinds of software.

Over the last year, two new services have gone online specifically for Commodore users. Some older networks have added or enhanced their Commodore SIGs, and at least one new general interest service has gone online with a Commodore SIG. Though all these services share many of the features listed above, each has something a little special tailored for different people. Here's a look at some of the highlights on each of these new systems.

American People/Link. The Commodore Club on this interactive online service is one of its most active areas, containing a massive data library. Like other services, it also features a conference area and message boards.

American Home Network, Inc., Arlington Ridge Office Center, 3215 N. Frontage Rd., Suite 1505, Arlington Heights, IL 60004; 800-524-0100 (Illinois residents call 312-870-5200), $3.95/hour (300 baud) and $4.95/hour (1200 baud) non-prime time. Prime time fees vary according to node used.

CompuServe. See "The Commodore SIG," elsewhere in this issue.

CompuServe, P.O. Box 20212, Columbus, OH 43220 800-848-8199. $39.95 registration fee; $12.50/hour (300 baud) $15/hour (1200 baud) prime time; and $6/hour (300 baud) $12.50/hour (1200 baud) non-prime time.

Delphi. Though Delphi has been around for a couple of years, the software was recently enhanced to provide for greater flexibility and usefulness. It's a general interest service, providing a forum for all kinds of computer users. There's a wide range of SIGs there, covering every major home computer as well as broader topics like astronomy, books, ham radio, movies, and travel.

Delphi has a general online conference area and a general mail area; you can check for mail or to see who's online when you first sign on. Each SIG also has its own conference and mail operations. When you enter a SIG, you can enter the conference area, ask to see who's online and where they are in conference, and either join a group in progress or look for a particular user. The MAILTHRU feature lets you send mail through Delphi to CompuServe, The Source, and MCI Mail.

Flagship Commodore is the special Commodore area on Delphi. Its sysop is Deb Christensen, former telecommunications manager for Commodore. The SIG features a public domain software library; round table discussion areas on things like graphics and music, the 128 computer, and 64 programming; bulletins on general Commodore information; and software reviews. Christensen also runs Flagship Amiga, a similar service for Amiga users.

Two other SIGs on Delphi that are not Commodore-specific but

Why settle for less when you can have Mo?

Now with free PLAYNET software too!

Mitey Mo turns your Commodore 64 into a telecommunications giant. It's the best-performing modem with upload/download.

Mitey Mo is being hailed as "the best price/performance communications package available." Its software has received the endorsement of the U.S. Commodore Users Group, which gives a money-back guarantee to members. It is truly the industry standard, and no wonder. It's the most user-friendly modem you can buy—it will take you online faster and easier than anything else.

Mitey Mo opens up a world of practical and exciting uses for your C-64. It lets you send and receive electronic mail, link up with community bulletin boards, play computer games with people in distant places, tap into library resources, and much more. All at your convenience.

Until Mitey Mo, Commodore's 1650 Automodem was the obvious choice when you went looking for a modem for your computer. Like Mitey Mo, it has "auto answer"—it receives data while unattended. And both modems are "auto dialers"—you dial right on the computer's keyboard. But that's about where the similarity ends.

Mitey Mo can dial up to 9 numbers sequentially. But suppose you dial a number and find it's busy. Mitey Mo has "auto redial"—it hangs up and redials immediately until it gets through. With the other modem you have to redial each time—and somebody with auto redialing can slip in ahead of you.

Mitey Mo is menu driven. It lists the things you can do on the screen. Select a number and you're on your way. Since Automodem isn't menu driven, you'll be hunting through the manual a lot.

With Mitey Mo, your computer's function keys are programmable—you can save yourself plenty of keystrokes. Not so with the other modem. And only Mitey Mo lets you store data to review or print it later.

Mitey Mo has just one switch, the Smart 64 software does the rest. With the other modem you'll have to remember to check three switches, otherwise you may be answering when you mean to be originating.

Mitey Mo is half the size of the other modem. The very latest technology allows miniaturization and increased reliability, as well. Mitey Mo is so reliable, we gave it a full three-year warranty. The other modem gives 90 days, then you're on your own.

Not only will you find Mitey Mo mighty useful, you'll find it mighty reasonably priced. When you buy it, you'll get $15 of CompuServe access time and 2 hours of PlayNet free, as well. See your dealer or call us directly to order your Mitey Mo.

MODEM FEATURES	MITEY MO	COMMODORE AUTOMODEM
Auto Dial/Answer	YES	YES
Auto Redial	YES	NO
Smart 64 Software	YES	NO
Function Keys Programmable	YES	NO
Upload/Download Text & X-Modem	YES	NO
VT-52/VT-100 Emulation	YES	NO
Menu Driven	YES	NO
28K Software Buffer	YES	NO
Easy-to-Use Manual	YES	NO
Bell 103 Compatible	YES	YES
Multiple Baud Rates	YES	YES
Cable Included	YES	YES
Single Switch Operation	YES	NO
Warranty	3 years	90 days

Some mighty interesting features—ours and theirs. Yours to decide.

CDI

Computer Devices Int'l
1345-A2 Doolittle Drive
San Leandro, CA 94577
(415) 633-1899

The Commodore SIG

There was a time when the term *Commodore SIG* (Special Interest Group) described an area on CompuServe. Started in 1983, the SIG was a special online forum staffed by Commodore employees and volunteer sysops (system operators) around the country. It consisted of the Commodore Newsletter, which provided information directly from Commodore; the Commodore HOTLINE, a question and answer area supported by Commodore Customer Support; and three smaller SIGs, where users exchanged information and public domain programs with Commodore representatives and other users via electronic mail and an online conference area.

Several months ago, Commodore agreed to lend exclusive marketing support to a new online service, QuantumLink, which would be designed solely for Commodore owners. This created a rather awkward situation when Commodore's contract renegotiations with CompuServe came up last summer. The two would, in effect, be competitors.

As a result, CompuServe has restructured its Commodore-related areas. The Toronto PET User Group (TPUG) now manages the three SIGs formerly operated by Commodore. But Commodore continues to maintain a presence on CompuServe, offering message boards, a conference area, a user interest log (where you can get information about other members), and the Commodore newsletter.

Why a separate network for Commodore owners? The reason relates not only to providing a machine-specific service, but to the continued health of the whole industry, says Steve Case, Quantum's vice president of marketing. "In order to really expand the market for computers long term, we had to create a dramatically increased utility because it seemed to a lot of people that the computer penetration level has slowed down. Somebody had to create a whole bunch of new ideas why people should buy computers.

"Telecommunications opened up a lot of those doors, but current services out there were a little expensive and a little too difficult to use. For the average guy, we needed to offer the market something that was a little easier and cheaper and more useful. In terms of moving the SIG over (to QuantumLink), that's just part of the process of trying to put everything in place in a single network to make it as convenient for our people as possible."

Since graphics capabilities of home computers differ, most online information services can display only text. QuantumLink, accessible only by Commodore computers, offers color graphics in many of its screen displays. This means you must get a special system disk from Quantum. You can't call the service using a regular terminal program.

Let's walk through your first time on QuantumLink. After you've loaded the program, you're asked a series of questions. Quantum will want to know how you wish to be billed (MasterCard, VISA, or automatic checking account deductions), what kind of modem you're using, how you'd like your name to appear to other users on the system, and what phone number you'll be calling to get on. This information is then stored on your disk. If you have an auto-dial modem, all you have to do is load the program, and you'll be connected to the system. (If you ever need to change this information, load the *Change Access* file on the disk.)

Once you're connected, what can you do? Here are some highlights.

People Connection lets you chat online with other members in a CB-type environment. *QGuides* are always available here to answer questions. People Connection also offers private interaction between users. If you want to speak to a specific person, you can transmit an online message, which will appear in a window at the top of the person's screen. So you can send messages back and forth without

which many Commodore users frequent are the Micro Artists Network (MANIAC), which contains a lot of sound and graphics programs available for downloading, and BOZART Magazine, a forum for writers to share their work (contributors receive a small royalty for each access by another user).

Delphi, 3 Blackstone Court, Cambridge, MA 02139 800-544-4005. $49.95 registration fee; $16/hour prime time and $6/hour non-prime time.

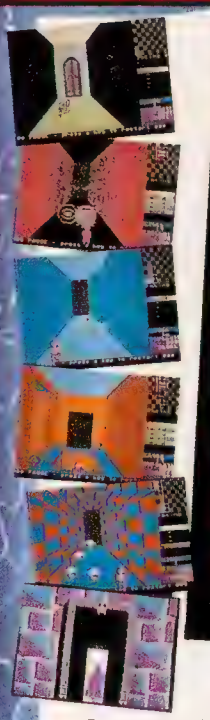
GEnie. This is a new telecommunications network sponsored by General Electric. Features include LiveWire (a CB simulator), E-Mail, software libraries, electronic newsletters and magazines, shopping services, and sophisticated gaming.

Deb Christensen also runs the Commodore SIG here, Flagship Commodore. Its structure is similar to that on Delphi, though it may evolve a little differently as a new group of users comes online.

If you wish, you can join GEnie via modem. Call 800-638-8369; on connection, enter **HHH** and return; at the U# prompt, enter **5JM11999,GEnie;** and press RETURN. The system will guide you through registration.

General Electric Information Services, 401 N. Washington St.,

THERE'S NO BEATING MASTERTRONIC



NEW

NEW

Zzzz

Featuring instantly drawn animated graphics, joystick driven icons and classic text input. This unusual adventure takes you into the dream world of Sleep. You wander through the 50 weird and wonderful locations seeking an escape from your nightmare.

Gates of Dawn

Now, for the first time, GATES OF DAWN will release you into the world of the dream. You must travel through these timeless passages as the knight of a bygone age. Much of what you see will not be as it appears and conversely much will happen that you cannot always see.

- **Let this Arcade Adventure take you into The World of Dreams and Beyond**
- **64 Screens of Mystery and Challenge**
- **Atmospheric Sound**
- **Marvellously Detailed Graphics and Animation**

MASTERTRONIC HAVE DONE IT AGAIN!

Bringing you an added dimension for your Commodore 64/128 with these two outstanding programs on Disc **Zzzz** and **The Gates of Dawn** for the incredible price of only **$9.99** each.

Mastertronic International Inc. 7311B Grove Road, Frederick, Maryland 21701 Tel: (301) 695 8877

missing out on what's going on. (This feature is available no matter what department you're in—you can send a message to any user currently signed on to the system.) If you want to find a partner to play an online game, the system will help you find someone who's interested.

Special conferences are also held here. QuantumLink schedules several forums a week, times at which Commodore representatives are available to answer questions online. (The people asking questions are never identified, so you don't have to worry about asking a stupid question.) General interest conferences on specific topics are also held.

The Commodore Information Network is similar to the old Commodore SIG on CompuServe, though different in structure. You can send questions to Commodore representatives, download public domain programs, read software reviews, and get updates on what's new at Commodore. There's even a special user group support roundtable, which offers advice on starting and maintaining Commodore user groups.

Just For Fun is just what it sounds like. Test your knowledge of trivia, read movie reviews, and compete with fellow subscribers in professional sports pools. The Shopping Center offers online shopping. In the Learning Center, you can sign up for the Electronic University, or do research using the online *American Academic Encyclopedia.* The Software Showcase lets you download previews of commercial software. And if you have any questions about QuantumLink itself, go to Customer Service.

Moving around within each department or from one department to another is very simple. You use only the function keys. To select a menu item, you cursor down to it and press f1. Pressing f3 lets you save up to 85 lines (this feature may be upgraded to allow more extensive downloads). Pressing f5 erases the current screen display, and f7 moves you back to the previous menu.

"What we've tried to do is create a more event-oriented social system so you really do want to check in every night...because you don't want to miss anything."

The monthly charge for QuantumLink is $9.95. Many of its services are free, but some, like program downloads and conference areas, require an additional six cents a minute ($3.60 an hour). When you're in one of these QLink Plus areas, you'll see a plus sign (+) in the upper-left corner of your screen indicating the extra charge.

If you've been on other online services, QuantumLink may seem a bit slow to you. There are two reasons for this, according to Steve Case. First, the use of color and graphics makes it necessarily run slower. And QuantumLink's software is designed to do an extensive amount of error-checking, so you don't get "garbage" characters on the screen.

Most services are dramatically better at 1200 baud, but, says Case, the fact of the matter is that there are a lot of 300 baud modems being used. There hasn't really been an inexpensive 1200 baud modem for the Commodore market until quite recently. Until 1200 baud is more of a standard, technicians at Quantum will look at ways to speed up 300 baud transmission without sacrificing quality.

At this point, much of the communication on QuantumLink concerns computer-related issues. Case says one of the long-term goals of the system is to go beyond being a technical resource, and offer a recreational, educational forum for people with all kinds of interests.

"The service you see now is a starting point, not an ending point," says Case. "It was designed with the focus on computer information, but new things will broaden the appeal to people who aren't user group hackers."

Emphasis on special events is one way to make that happen, he says. "Most services are information and retrieval oriented, and it doesn't matter if you got on Tuesday or Thursday because the information is the same. What we've tried to do is create a more event-oriented social system so you really do want to check in every night just to see what's happening because you don't want to miss anything."

To subscribe to QuantumLink, write to QuantumLink Customer Service, 8620 Westwood Center Drive, Vienna, VA 22180 or call 800-392-8200.

Rockville, MD 20850; 800-638-9636, ext. 21. $18.00 registration fee; $35/hour prime time and $5/hour non-prime time.

QuantumLink. (See "The Commodore SIG," elsewhere in this issue.

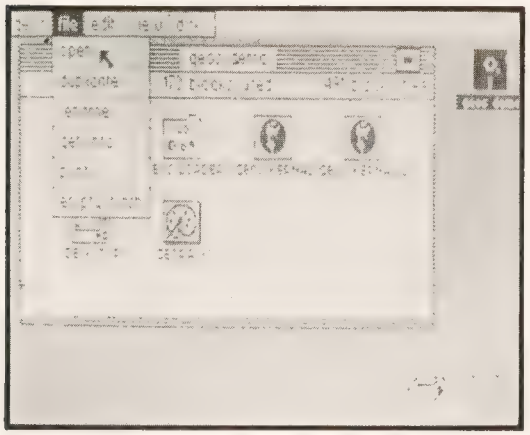
Viewtron. Color graphics highlight this new service offered to Commodore owners by Viewdata Corporation, a subsidiary of Knight-Ridder Newspapers. The service was initially available only through a single-function terminal, but has been revised to allow microcomputer owners to access it.

Viewtron offers the same kind of information and user interaction as the other major online services. Commodore owners can read software and hardware reviews, get advice from Commodore experts and other users, and get discounts on hardware and software via mail order. Because of its graphics capabilities, subscribers must obtain a special system disk from Viewdata to access it.

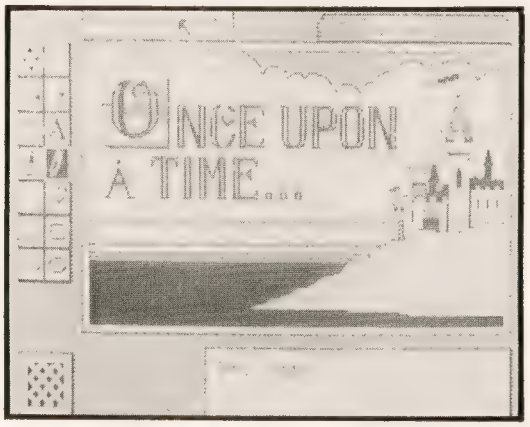
Viewdata Corporation of America, Inc., 1111 Lincoln Rd., 7th Floor, Miami Beach, FL 33139; 800-543-5500, Department 9401. $9.95 for Software Starter Kit; 22 cents/minute prime time and 9 cents/minute non-prime time after the first free hour.

The Commodore 64® comes of age. . .

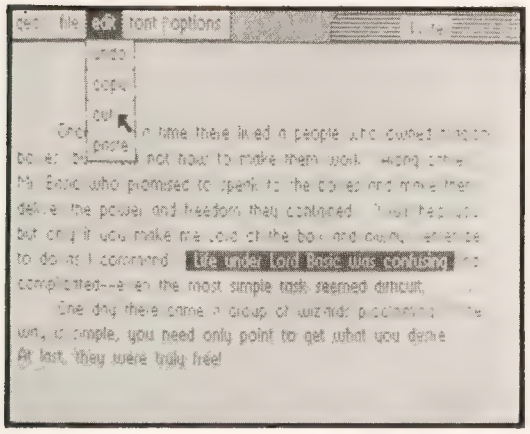
With **GEOS**,™ the C64 reaches its full potential. More than just another application, the **G**raphic **E**nvironment **O**perating **S**ystem integrates new and old programs with greater ease and speed.



GEOS Desktop.™ File handling is as easy as pointing. Run, copy or delete files with a joystick click. Desk accessories include an alarm clock, notepad, photo and text albums — even a full-function calculator. It all adds up.



geoPaint.™ For creating charts and diagrams, or just creating. Substitute a picture for a thousand words. Paint with different brushes. Try a pattern fill, or perhaps the ruler function, for good measure.



geoWrite.™ Create high quality documents. Insert. Delete. Copy or move blocks of text. Select expressive font styles. Underline. Be **Bold.** Try *Italic.* Let your fingers do the talking.

GEOS:™ It's a whole new world for the C64.

To order, call (800) 443-0100 EXT. 234

GEOS™ Introductory Offer

$59.95

BERKELEY SOFTWORKS

GEOS, GEOS Desktop, geoPaint, geoWrite, diskTurbo, and Berkeley Softworks are trademarks of Berkeley Softworks.

Commodore 64 and C64 are trademarks of Commodore Electronics. Ltd.

GEOS™

GEOS Diskette includes Desktop, diskTurbo, geoPaint, and geoWrite.
$59.95. CA residents add 6.5% tax. ($4.50 US/$7.50 Foriegn shipping and handling)
US funds only.

___ Check or money order ___ VISA ___ Mastercard

Acct. # _____ Exp. Date _____

Name _____

Address _____

City, State, Zip _____

Send to: Berkeley Softworks-Order Processing
P.O. Box 57135
Hayward, CA 94545

Allow 4-6 weeks for delivery. Introductory price through May 31, 1986.

A Buyer's Guide To Modems

Telecommunications is one of the fastest growing areas of computer use for Commodore owners. All you need to get started are your computer, a terminal program, and the right modem. Here's a look at the range of inexpensive modems currently on the market.

Online services, bulletin boards, home banking, and a host of other telecommunications opportunities are currently available to Commodore owners. And the list is growing all the time. (See "What's New Online For Commodore" in this issue.)

Thousands of Commodore computer owners have already added telecommunications to their regular computing activities. If you're interested in getting started, or simply want to buy a different modem from the one you have, the following chart should answer most of your questions. We've kept our list to those modems that cost under $300. But for many Commodore owners, a satisfactory modem can be purchased for less than half that price. And the least expensive, Commodore's 1600 VICModem, costs under $50. The higher the price of the modem, the more capabilities you'll get. Features such as auto-answer and auto-originate can give you flexibility and speed, especially important if you're online extensively.

For those unfamiliar with computer telecommunications, a modem (MOdulator-DEModulator) is simply a device that translates your computer's digital data into analog, or continuous-tone, transmissions carried by telephone lines. The computer at the other end of the telephone line uses its modem to alter the transmission back to digital form.

We've listed the most important features you should consider. Here's a brief explanation of some of the categories:

• **Compatibility**—Commodore 64- and 128-compatible modems usually connect directly to the computer through the user port; RS-232 modems require an interface adapter since Commodore computers don't have a standard RS-232 port.

• **Baud Rate**—The speed at which bits of data are transmitted. The bulk of the low-cost modems carry data at 300 baud, although an increasing number of modems are capable of faster 1200 bits per second speed.

• **Duplexing**—Modems communicate at half-duplex (one computer sending or receiving at a time) or full-duplex (both computers sending and receiving at the same time). Most modems are capable of both half and full duplexing.

• **Auto-Answer/Auto-Originate**—Can the modem automatically answer calls and receive information; can it automatically dial telephone numbers and connect your computer to other computers?

• **Self-Test**—A modem's ability to check itself to determine if everything is working, and is connected correctly.

• **Carrier Detection Indicator**—A light—usually a light-emitting diode (LED)—a sound, or a screen message that indicates that your computer has connected and disconnected with another computer.

• **Terminal Software Included?**—Many modems are sold with a telecommunications program included in the package. If not, you'll need to purchase your own terminal software.

Modem Manufacturers And Distributors

Listed below are the manufacturers and distributors of the modems included in this buyer's guide.

Anchor Automation, Inc., 6624 Valjean Avenue, Van Nuys, CA 91406, 818-997-6493

Commodore Business Machines, 1200 Wilson Drive, Westchester, PA 19380, 215-431-9100

Computer Devices International, 1345-A2 Doolittle Drive, San Leandro, CA 94577, 415-633-1899

E & E DataComm, 2115 Ringwood Avenue, San Jose, CA 95131-1725, 408-288-8880

Hayes Microcomputer Products, 5923 Peachtree Industrial Boulevard, Norcross, GA 30092, 404-449-8791

Inmac, 2465 Augustine Drive, Santa Clara, CA 95051, 408-727-1970

Intec Corp., 21751 West Nine Mile Road, Southfield, MI 48075, 313-352-0066

MFJ Enterprises Inc., 921 Louisville Road, Starkville, MS 39759, 601-323-5869

The Microperipheral Corp., 2565 152nd Avenue NE, Redmond, WA 98052, 206-881-7544

Mitsuba, (US Distributor: Everett/Charles Marketing Services, Inc.), 6101 Cherry Avenue, Fontana, CA 92335, 714-899-2521

Novation, Inc., 20409 Prarie Street, Chatsworth, CA 91311, 818-996-5060

Qubie´, 4809 Calle Alto, Camarillo, CA 93010, 805-987-9741

TNW Corp., 3444 Hancock Street, San Diego, CA 92110, 619-296-2115

Tandata Marketing Ltd., Albert Road North, Malvern, Worcs WR14 2TL, England (US Agent: US Telecom Inc., 315 Greenwich Street, New York, NY 10013, 212-608-1419)

Touchbase Design, 1447 South Crest Drive, Los Angeles, CA 90035, 213-277-1208,

US Robotics, Inc., 1123 West Washington, Chicago, IL 60607, 312-733-0497

Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805, 205-837-8100

1-800-FLOPPYS, 22255 Greenfield, Southfield, MI 48075, 800-356-7797

Jet

A New Dimension in Fun

Easy aircraft control, coupled with unexcelled omnidirectional visual (plus audio) references and ballistic power, provide the speed and aerobatic maneuverability that add up to pure fun. Engage in a wide variety of combat scenarios (land-based F-16 or carrier-based F-18), or fly over detailed United States scenery at Mach 2.

subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

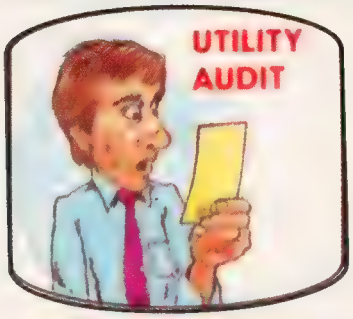
Order Line: (800) 637-4983
(except in Illinois, Alaska, and Hawaii)

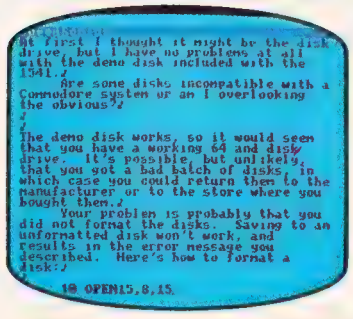
A Buyer's Guide to Modems

Modem	Manufacturer	Compatibility	Interface Required?	Baud Rate	Duplexing	Auto-Answer	Auto-Originate	Self-Test	Carrier Detection Indicator	Power Supply	Cables/ Connectors Included?	Terminal Software Included?	Warranty	Price	Comments
Volks 6420	Anchor Automation, Inc.	64, 128 (in 64 mode)	no	0-300	full/half	yes	yes	no	screen	host computer	yes	yes	2 years	$ 99	
Volks 6470	Anchor Automation, Inc.	64, 128 (in 64 mode)	no	0-300 & 1200	full/half	yes	yes	no	screen	host computer	yes	yes	2 years	199	
1660 Modem	Commodore Business Machines, Inc.	64, 128	no	0-300	full/half	yes	yes	no		host computer	plugs into computer	yes	90 days	129.95	
1670 Modem	Commodore Business Machines, Inc.	64, 128	no	0-300 & 1200	full/half	yes	yes	no		host computer	plugs into computer	yes	90 days	199.95	
1600 Modem	Commodore Business Machines, Inc.	VIC-20, 64	no	0-300	full	no	no	no	LED	host computer	plugs into computer	yes	90 days	49	
Mitey Mo	Computer Devices International	RS-232	no	300	full/half	yes	yes	yes	screen	host computer	yes	yes	3 years	99.95	
Avatex 300	E & E DataComm	VIC-20, 64, 128	yes	0-300	full	no	no	no	LED	AC	no	no	3 years	64.95	
Avatex 600	E & E DataComm	VIC-20, 64, 128	yes	0-600	full	yes	no	no	LED	AC	no	no	3 years	99.95	
Avatex 1200	E & E DataComm	VIC-20, 64, 128	yes	0-600 & 1200	full	yes	yes	yes	LED	AC	no	no	3 years	199.95	
Smartmodem 300	Hayes Microcomputer Products	RS-232	yes	0-300	full/half	yes	yes	yes	LED	AC	no	no	2 years	199	
Password 212A	Inmac	RS-232	yes	300 & 1200	full/half	yes	yes	yes	screen	AC	some	no	1 year	299	
Clear Signal 1200 Baud Modem	Inmac	RS-232	yes	1200	full/half	no	no	no	LED	AC	some	no	1 year	259	
Smart 300 Baud Modem	Inmac	RS-232	yes	0-300	full	yes	yes	no	LED	AC	some	no	1 year	229	
Clear Signal 300 Baud Modem	Inmac	RS-232	yes	300	full	no	no	yes	LED	AC	some	no	1 year	99	
Intec 1200	Intec Corp.	RS-232	no	300/1200	full/half	yes	yes	no	screen	AC	yes	yes	1 year	199	
Intec 300	Intec Corp.	RS-232	no	0-300	full/half	yes	yes	no	LED & screen	AC	yes	yes	1 year	109	
MFJ-1237	MFJ Enterprises	VIC-20, 64	no	300	full	no	no	no	LED	host computer	yes	program listing in manual	1 year	49.95	limited supply
Microconnection Auto-Print	The Microperipheral Corp.	RS-232	no	300	full/half	yes	yes	no	LED	host computer	yes	yes	90 days	69.95	
Super Modem 1200	Mitsuba	RS-232	yes	0-300 & 1200	full/half	yes	yes	yes	LED	AC	yes	no	1 year	299	
Cat	Novation, Inc.	RS-232	yes	0-300	full/half	no	no	yes	LED	AC	yes	no	1 year	169	
D-Cat	Novation, Inc.	RS-232	yes	0-300	full/half	no	no	yes	LED	AC	yes	no	1 year	199	
J-Cat	Novation, Inc.	RS-232	yes	0-300	full/half	yes	yes	yes	LED	AC	yes	no	1 year	149	
PC 212/1200	Qubie	RS-232	yes	0-300	full	yes	yes	no	LED	AC	no	no	1 year		
Operator 103	TNW Corp.	RS-232	yes	0-300	full/half	yes	yes	yes	beep	AC	yes	no	90 days	129	
Tm 110	Tandata Marketing, Inc.	VIC-20, 64, 128 (in 64 mode)	yes	300	full	no	yes	no	screen	AC	yes, w/ROM cartridge	yes, w/ROM cartridge	90 days	199	separate ROM cartridge required
Travelcomm 1200	Touchbase Design	RS-232	yes	300/1200	full/half	no	yes	no	LED	battery	no	no	1 year	249	
Password 300	US Robotics, Inc.	RS-232	yes	300	full/half	yes	yes	no	none	AC	yes	no	2 years	199	
UDS-103JLP	Universal Data Systems	RS-232	yes	0-300	full	yes	no	no	light	telephone line	phone cable included	no	1 year	165	
UDS-103LP	Universal Data Systems	RS-232	yes	0-300	full	no	no	no	light	telephone line	phone cable included	no	1 year	125	
UDS-212LP	Universal Data Systems	RS-232	yes	0-300 & 1200	full	no	no	no	LED	telephone line	phone cable included	no	1 year	295	
300 Baud Smart Communications System	1-800-FLOPPYS	64, 128	no	0-300	full/half	yes	yes	no	LED & screen	AC	yes	yes	1 year	69.90	
1200 Baud Smart Communications System	1-800-FLOPPYS	64, 128	no	300 & 1200	full/half	no	yes	no	LED & screen	AC	yes	yes	1 year	99.90	

FREE SOFTWARE

Now Get Up To 200 FREE Programs When You Subscribe to *COMPUTE!'s Gazette* Today.




At first I thought it might be the disk drive, but I have no problems at all with the demo disk included with the 1541.
Are some disks incompatible with a Commodore system or am I overlooking the obvious?
The demo disk works, so it would seem that you have a working 64 and disk drive. It's possible, but unlikely, that you got a bad batch of disks, in which case you could return them to the manufacturer or to the store where you bought them.
Your problem is probably that you did not format the disks. Saving to an unformatted disk won't work, and results in the error message you described. Here's how to format a disk:
10 OPEN15,8,15,

Subscribe to ***COMPUTE!'s Gazette*** today and you'll be getting a lot more than just another computer magazine. That's because ***COMPUTE!'s Gazette*** comes complete with up to 20 FREE programs in each big issue.

Subscribe now and you can depend on a steady supply of high quality, fun-filled programs for your Commodore 64, Commodore 128, or VIC-20 computer—programs like Number Quest, Address File, Treasure Hunt, Castle Dungeon, Vocab Builder, SpeedScript, and hundreds of other educational, home finance, and game programs the entire family can use all year long.

The free programs alone are worth much more than the low subscription price. But there's much more to ***COMPUTE!'s Gazette*** than just free programs.

COMPUTE!'s Gazette's superb articles deliver the latest inside word on everything from languages to interfaces...programming to disk drives. And our up-to-the-minute software reviews are must reading.

Whether you're a novice or an experienced user, ***COMPUTE!'s Gazette*** is perfect for you. So subscribe today. Return the enclosed card or call 1-800-247-5470 (in Iowa 1-800-532-1272).

COMPUTE! Publications, Inc. abc
One of the ABC Publishing Companies
825 7th Avenue, 6th Floor, New York, NY 10019
Publishers of COMPUTE!, COMPUTE!'s Gazette, COMPUTE!'s Gazette Disk, COMPUTE! Books, and COMPUTE!'s Apple Applications

**** FREE SOFTWARE ** FREE SOFTWARE ** FREE SOFTWARE ****

User Group Update

When writing to a user group for information, please remember to enclose a stamped, self-addressed envelope.

Send typed additions, corrections, and deletions for this list to:

COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403
Attn: Commodore User Groups

Safeguard your latest software by making a backup with

THE 3 BEST COPIERS AVAILABLE ALL IN ONE SUPER PACKAGE

No hardware necessary, easy to use, NEW! MasterKey™ system makes Diskmaker virtually 100% effective!

Copies new custom G.C.R. code protection, long data-block logic, no-sync data blocks, NEW wide head protection, and many other specialized protection routines. Copies normal and protected disks. Includes 3 copiers — FAST copier, VARI-SECTOR copier, and AUTO-LOGIC NIBBLER. Actually copies a full disk in only 2 minutes. Inexpensive module releases keep you up-to-date. MODULES available by subscription or individually.

Only $49.95 for copier system

To order CALL 805-687-1541 ext 64
Technical line 805-682-4000 ext 99

Also available DiskMaker™ ToolKit™, SUPER Disk Utility package. Ask for SPECIAL Combo offer with DiskMaker™.

Order by phone 24 hrs/7 days or send cashiers check/money order Payable to BASIX. Visa, MasterCard & American Express include card # and exp. date. Ca. residents add 6% tax. Allow 2 weeks for clearance of personal and co. checks. Add $3.50 shipping/handling for continental US. $5.50 for UPS air. COD's shipped to 48 states only, add $4.00. AK, HI, APO, FPO add $7.50. Canada add $10.00. Other foreign orders add $15.00 and remit, certified US funds only. No credit card orders from outside North America. Dealers & Distributors invited & supported.

DISKMAKER PAYS FOR ITSELF THE FIRST TIME YOU USE IT

basix
3463 State Street · Suite 154TA · Santa Barbara · CA 93105

User Group Notes

The Unknown Programmers Users Group can now be reached at: P.O. Box 14347, Phoenix, AZ 85063.

The Capital Region Commodore Computer Club (CRCCC) has a new address: P.O. Box 2372, Vernon, CT 06066.

Also listing a new address is the Jumpers 64 Users Group: P.O. Box 224, Glen Burnie, MD 21061.

The Carolina Commodore Computer Club, formerly the Raleigh VIC/C64 Users Group, can be reached at P.O. Box 2664, Raleigh, NC 27602-2664.

The Lubbock Commodore Users Group, the VIC Users Group, and the South Plains '64 Users Group have consolidated to form the Commodore Users of Texas (CUT). The address is 5509 Harvard, Lubbock, TX 79416.

New Listings

ARKANSAS

River City Commodore Club, P.O. Box 4298, North Little Rock, AR 72116

FLORIDA

Gulf Coast Computer Club, P.O. Box 1104, Port Richey, FL 34288-1104

GEORGIA

Griffin Commodore Program Exchange (GCPE), Jeff Lee, 1820 Hallmark Dr., Griffin, GA 30223

LOUISIANA

Page User Group For C-64, 403 19th St., Alexandria, LA 71301

Sixty Four'Um User Group, 4317 Stockton St., Metairie, LA 70001

MARYLAND

C-16 & Plus/4 Users Group, Michael Kaszubski, 8202 Edwill Ave., Baltimore, MD 21237

MINNESOTA

Duluth Commodore Users Group, Allen Lehrke, 1502 Fairview, Cloquet, MN 55720

NEW JERSEY

Commodore 64 Users Group of America, 114 Lake Ave., Clifton, NJ 07011

Commodore User Group of Hillsdale (CUGOH), 22 Palm St., Hillsdale, NJ 07642

PENNSYLVANIA

Ingersol Rand Commodore Computer Users Group (IRCCUG), 402 S. Keyston Ave, Sayre, PA 18840

Commodore Users of Berks (CUB), Dan Schein, 2455 McKinley Ave., West Lawn, PA 19609

UTAH

Roosevelt Area Commodore Enthusiasts (RACE), Mike Horrocks, HCR Box 30, Neola, UT 84053

Grolier Electronic Publishing announces one of the greatest advances in telecommunications since Bell told Watson, "I want you."

The Information Connection™ is the first access software that takes the mystery out of using a modem.

And, given the frustration that modems have caused computer users, that is a great advance.

The Information Connection makes using a modem as easy as dialing a telephone.

It teaches you everything you need to know about going online—in just minutes—right on the screen, and lets you practice without going online.

Miraculously, its ease of use is matched by its phenomenal power. Far greater power than you would get from telecommunications software costing three or four times as much.

So you can grow with *The Information Connection.* But you can never outgrow it! For it has more power than even a "power user" can use up.

With *The Information Connection,* you and your computer are connected to online databases, electronic mail services and bulletin boards. To computers down the block and around the world. To 300, 1200 or 2400 Baud modems. Instantly.

You merely have to point to make your computer dial, hang up, capture or upload text. A built-in text editor lets you create, edit, send and receive standard ASCII files—compatible with most word processors.

You can easily access services like CompuServe and The Source—automatically—thanks to pre-written "macros" (scripts), saving time and money.

The Information Connection: because you want your first access software to be the best you can buy. And the last you'll ever need to buy.

Connect now. At your favorite computer software dealer.*

THE INFORMATION CONNECTION™

It demystifies using a modem. And gives you access to the world.

$39.95 Commodore 64™ and 128™

$59.95 Apple® II family and IBM® PC and compatibles

*If your dealer doesn't yet have *The Information Connection,* order directly by calling Jean Cleary toll-free at **1-800-858-8858 ext. 3530**. Major credit cards honored—and satisfaction guaranteed. Shipping, handling and tax additional.

The Information Connection is a registered trademark of Grolier Electronic Publishing, Inc. Apple is a registered trademark of Apple Computer, Inc. Commodore is a registered trademark of Commodore Business Machines, Inc. IBM is a registered trademark of International Business Machines, Inc.

Grolier Electronic Publishing, Inc.
SHERMAN TURNPIKE, DANBURY, CONNECTICUT 06816 • (800) 858-8858

OUTSIDE THE U.S.

AUSTRALIA

Hedland Commodore Computer Group, John Noblet, 10 Barker Court, Port Hedland 6721, Western Australia

CANADA

Diskmaster Club, Michael Lalonde, 1326 Hastings Crescent, Sudbury, Ontario, Canada P3A-2R5

Anthrax Commodore Users Group, 2360 Weston Rd., Suite 102, Toronto, Ontario, Canada M9N 1Y9

NORWAY

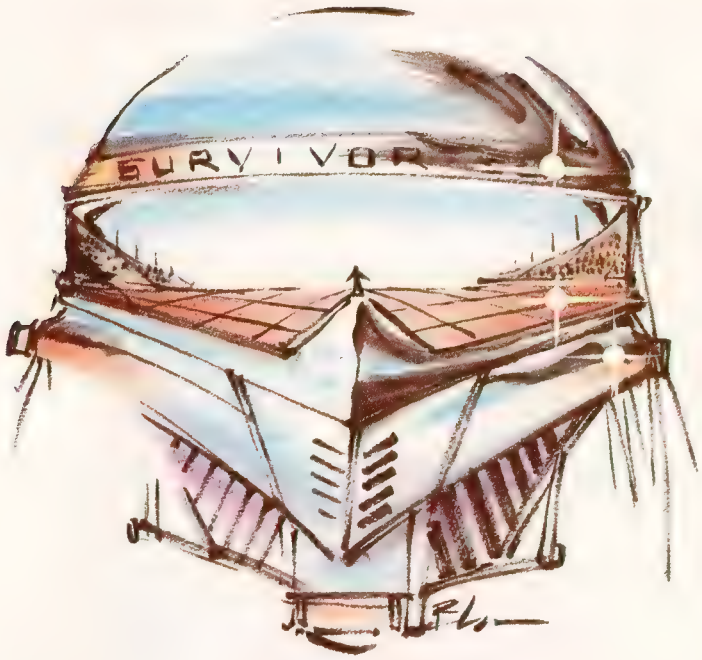
Anthon's 64 User Group, Box 1346, 6401 Molde, Norway

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

Free Publications

Use the handy order form in the tax package to obtain free IRS publications on over 90 different tax topics.

A PUBLIC SERVICE MESSAGE FROM THE INTERNAL REVENUE SERVICE



Survivor

Kevin Mykytyn and Mark Tuttle

This game should be played only when you're at your best: quick of eye, quick of mind, and quick of hand. A two-player contest that allows only one "survivor." For the Commodore 64, 128 (in 64 mode), Plus/4, and 16. Two joysticks are required.

It's late in the twenty-third century, a time when Earth's space colonies have expanded into new galaxies, and humans have developed strange new powers and abilities. One of these, genetic restructuring, has been responsible for much of the recent increase in colonization. The process allows colonists to adapt their physical form to suit conditions on any planet.

In the newest colony, Galactica Temporan #1, the metamorphosis has been taken to an extreme. The people of this outpost have been forced to assume a new robot-like bodily identity in order to subsist and to survive the bizarre climate. These colonists are at the vanguard of twenty-third century technology, but, as in many new colonies far removed from their mother country, the social environment is highly unstable. Pyrian, the colony's leader, is stern and demands dedication and hard work to keep Galactica Temporan #1 the leader in the latest phase of the colonization program.

But the colonists, some of the best researchers available, are, despite their crablike appearance, only human. And arguments, fights, and rivalries have been cropping up. Not surprisingly, conflict between the armored, robotized humans tends to lead to a serious and irreversible outcome. Colony population has been suffering. Pyrian's initial disciplinary efforts were to little avail. Now a new law is effected, a law that Pyrian hopes will eliminate all disorder—and terminate all troublemakers.

He has devised an enclosed, gridlike arena in which two agitators fight until one is destroyed. The only way out is to survive the duel. Pyrian has employed many of modern science's most impressive discoveries in the operation of the arena. The resulting pyrotechnics are quite entertaining, and the watching crowd enjoys the temporary diversion, but is also reminded of the penalty for serious disorder.

Pyrian's arena includes energy and matter transmission, the ability to spontaneously generate simple life forms, and even an ingenious method of sustaining the life of a combatant through five lethal exchanges. After all, the effect of the spectacle is much reduced if it ends too soon, if the combat is not hard and long and bitter. For the fighter who emerges from Pyrian's arena must be seen to transcend the pain and terror of the punishment. Only then is the former agitator seen as a survivor, and surely now a worthy member of Galactica Temporan #1.

Getting Into The Arena

"Survivor" is a two-part program. Program 1 is a BASIC loader which automatically loads Program 2, a larger machine language program. As listed, it runs on the Commodore 64. If you have a Plus/4 or 16, substitute these lines in Program 1:

```
QK 130 A$=CHR$(129):COLOR 0,1:
       COLOR 4,1:POKE2025,255:
       BC=685:BK=685
BA 230 IFJOY(1)>127ORJOY(2)>12
       7THENPOKE1352,255:COLOR
       4,2,4:GOTO250
RQ 350 COLOR 1,2,4:RETURN
JH 390 FORI=1TO9:COLOR 0,T2:FO
       RJ=1TO50:NEXTJ:COLOR 0,
       1:FORJ=1TO50:NEXTJ,I
MD 410 IFJOY(1)>127ORJOY(2)>12
       7THEN330
```

After typing in Program 1, save a copy. To enter program 2 on a 64, you'll need MLX, found elsewhere in this issue. (If you have a Plus/4 or 16, see the instructions below.) After loading and running MLX, respond to the starting and ending address prompts with **2800** and **32C7**, respectively. When you've finished, be sure to save it with the filename "SURVIVOR 2". Tape users should save Program 2 immediately following Program 1. Program 1 will automatically load Program 2.

If you like the fast action of "F-15 Strike Eagle", here is your next flight—

GunShip

NEW REVOLUTIONARY 3-D GRAPHICS SYSTEM!!! COMING THIS SPRING

THE HELICOPTER SIMULATION

Clear the pad and get ready to experience the thrill and excitement of low level, high speed helicopter flight in a variety of realistic combat missions with GUNSHIP, the AH-64 APACHE Attack Helicopter Simulation!! GUNSHIP puts you in the cockpit of this high tech attack helicopter and gives you the sophisticated Integrated Helmet Targeting System (IHTS), gun tracking modes, air-to-air missles, and multiple navigation systems needed to accomplish your challenging Search and Destroy, Rescue, and Covert missions! GUNSHIP's revolutionary 3-Dimensional graphics and outstanding joystick flying system allows you to realistically experience the world of modern helicopter combat, and rivals the simulations used to train real Army GUNSHIP pilots. So get ready to test your skill, cunning, and flying ability with GUNSHIP, the latest in an ever growing line of exciting real-life simulations from MicroProse.

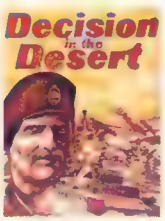
GUNSHIP is coming soon for Commodore 64/128, Apple II family, IBM PC/PC Jr., Atari and Amiga computers for a suggested retail of $39.95. Call or write for specific machine availability, and for MC/VISA orders.

COMMODORE and AMIGA, APPLE, IBM and ATARI are registered trademarks of Commodore Business Inc., Apple Computer Inc., International Business Machines Inc., and Atari Inc., respectively.

Experience the reality of these other great simulations from MicroProse

Challenging and Exciting Air Combat from the Modern Electronic Cockpit!

Exciting World War II Submarine Action in the Pacific!



You are in Command—North Africa 1940-1942!

MICRO PROSE
SIMULATION • SOFTWARE

120 Lakefront Drive Hunt Valley, Maryland 21030 301-667-1151

If you own a Plus/4 or 16, you don't need MLX to enter the machine language portion. You can use the built-in machine language monitor. First, enter MONITOR to exit BASIC. Type **F 2800 32C7 00** to fill that section of memory with zeros. You could skip this step if you wish, but when locations 2800–32C7 are initialized to zero, it makes it easier to see how far you've come. Next, type **M 2800**, which displays the contents of a section of memory. Now enter Program 2, *ignoring the last number on each line of the program listing.* The final number is a checksum used by MLX; it's not necessary when you're entering numbers into the monitor. Make sure you press RETURN after each line has been typed. When you finish a section of memory, type M and the next section of memory will be displayed. To save to disk, enter **S "SURVIVOR 2",8,2800,32C8** (tape users should change the 8 to a 1 immediately after the program name).

128 owners have two choices. Either go into 64 mode and enter Program 2 with MLX, or stay in 128 mode and use the built-in monitor as described above.

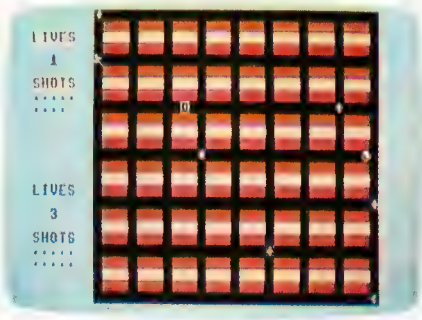
To play Survivor, just load Program 1. Be sure to have two joysticks plugged in. When you're ready to begin, type RUN.

Player 1 controls the joystick plugged into port 1, and is represented by the green character found at the lower right when the game begins. Player 2 uses the joystick in port 2, and is represented by the yellow character found at the top left corner. To the left of the playing area is the number of lives and shots remaining displayed in the color corresponding to each player.

The Basics

The object of the game is, as the title implies, to survive. The unfortunate consequence is that your opponent must not survive. As you may recall, Pyrian has devised a method whereby each player can absorb five lethal hits (or "lives," as displayed on the screen). The first player to lose all five loses the game.

Using a joystick, each player maneuvers through the grid. Each has ten shots at the start. To fire, press the fire button. The shot will travel in the same direction as you are moving (or, if you're firing while stationary, the shot will travel in the direction you were last moving). You can fire rapidly, but remember that your shot supply is limited; you'll notice the number of available shots being reduced in the player's statistics area to the left of the playing field.



The green player (lower right) and yellow player (upper right) at a strategic point of play. (See the Game Elements figure.)

When a life is lost by either player, provided it's not the last one, the screen is cleared. A timer located between the two groups of player statistics will count down. When it reaches 0, each player's shot total is restored to 10, and a new round begins. When a champion is determined, the color of the winning player (green or yellow) is flashed, and a prompt to play again is offered.

Squiggles And Pods

Besides contending with a wily human opponent, you must be constantly aware of a number of other game elements. The five Squiggles roaming the grid are to be avoided at all times. Contact with one of these will result in the loss of a life. These creatures randomly move about the grid and can be destroyed only by being shot. (Note: One shot may not always be sufficient.) Each time a Squiggle is destroyed, a new one evolves from the center of the screen, so there will always be five to contend with. Although their movement is random, you can sometimes use them to your advantage while trying to outwit your opponent.

Besides the Squiggles, there are four "pods," some of which can work for or against you. Appearing randomly are the Elemental, Speed, Transpositional, and Shot pods. Each of these represents a type of action that will occur if a player moves over the pod. (See the Game Elements figure.)

The Elemental pod is probably the most desirable of all. Passing over it releases the Creature, who chases your opponent. Although the lifespan of a Creature is limited, he's indestructible. But if the Creature is chasing you and the elemental pod reappears, you can pass over it and the Creature will chase the other player. The Creature is extremely intelligent and will stop at nothing to destroy the one it pursues.

The Speed pod temporarily doubles your speed. This helps your evasion ability and allows you to reach other pods more swiftly.

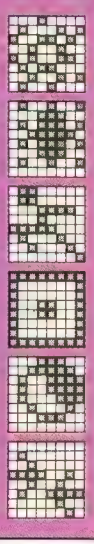
The Transpositional pod will swap the positions of the two players. This can be used to great tactical advantage. For example, hover near this pod until a Squiggle is almost on you and then pass over it. Your opponent is nearly helpless in this situation. He probably won't have time to react.

Finally, the Shot pod will allow you to replenish your shots any time your supply falls below ten. You must sit on this pod while the number of shots slowly rebuilds. Ten is the maximum you can get.

All of the pods appear and disappear randomly—and they may appear more than once during a round.

See program listing on page 106.

Game Elements



Creature

Squiggle

Speed pod

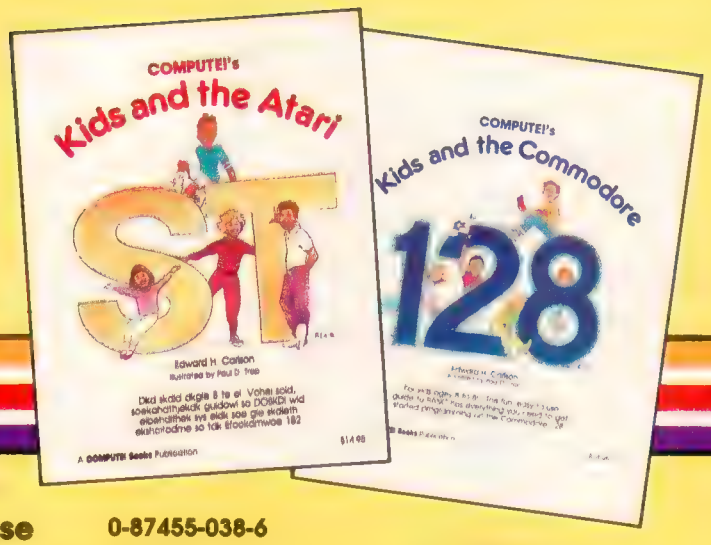
Shot pod

Elemental pod

Transpositional pod

NEW

COMPUTE! Books For Kids



Help your children learn the basics of computer programming with these two new entertaining and educational books from COMPUTE!.

0-87455-038-6
$14.95

0-87455-032-7
$14.95

Each book contains easy-to-follow instructions, programming examples, quick reviews, and colorful illustrations. Written in COMPUTE!'s clear, easy-to-understand style, the books offer hours of entertainment while helping kids (and adults) learn to program in BASIC.

If you're acquainted with BASIC, you can easily write your own games and applications on Atari's ST or Commodore's 128 computers. Over 30 sections—all with instructor notes, lessons, assignments, and lively illustrations—entertain and amuse as you learn to use these powerful computers. *COMPUTE!'s Kids and the Atari ST* and *COMPUTE!'s Kids and the Commodore 128*, in the bestselling series from author Edward Carlson, are gentle introductions to programming your new computer. Clear writing and concise examples, both trademarks of this series, make it easy for anyone—child or adult—to learn BASIC painlessly.

Look for these and other books from COMPUTE! at your local book store or computer store. Or order directly from COMPUTE!.

To order, call toll free in the US 1-800-346-6767 (in NY 212-887-8525) or mail the attached coupon with your payment to COMPUTE! Books, P.O. Box 5038, F.D.R. Station, New York, NY 10150.

Please send me the following COMPUTE! books. My payment is enclosed.

_____ ***COMPUTE!'s Kids and the Commodore 128,*** (032-7) $14.95 each _____

_____ ***COMPUTE!'s Kids and the Atari ST,*** (038-6) $14.95 each _____

Subtotal _____

NC residents add 4.5% sales tax _____

Shipping and handling per book (in U.S. and surface mail, $2.00 per book; airmail, $5.00 per book.) _____

Total amount enclosed _____

ALL ORDERS MUST BE PREPAID IN U.S. FUNDS

☐ Payment enclosed (check or money order)
☐ Charge ☐ MasterCard ☐ Visa ☐ American Express

Account No. _____ Exp. Date _____ (Required)

Name _____

Address _____

City _____

State _____ Zip _____

Please allow 4–6 weeks for delivery.

36312012

COMPUTE!™ Publications, Inc. abc
One of the ABC Publishing Companies
825 7th Avenue, 6th Floor, New York, NY 10019
Publishers of COMPUTE!, COMPUTE!'s Gazette, COMPUTE!'s Gazette Disk, COMPUTE! Books, and COMPUTE!'s Apple Applications.

COMPUTE! books are available in the U.K., Europe, the Middle East, and Africa from Holt Saunders, Ltd., 1 St. Anne's Road, Eastbourne, East Sussex BN21 3UN, England and in Canada from Holt, Rinehart, & Winston, 55 Horner Avenue, Toronto, ON M8Z 4X6.

Kevin Mykytyn and Mark Tuttle

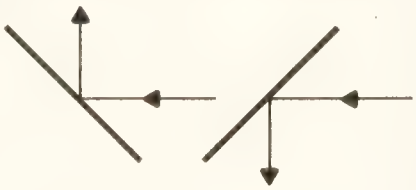
Fast reflexes are the key ingredient for success in this action game for two players. For the Commodore 64, 128 (in 64 mode), Plus/4, or 16. Two joysticks are required.

There's little time to think once the zorba disk hits the playing field in "Shifter." The field is covered with small white bars—shifters—that can change the direction in which the disk is moving. Your job is to prevent the zorba disk from passing through your scoring zones, while trying to steer the disk through your opponent's.

The game begins with your selection of a skill level from one to three; one is the most difficult, so beginners will probably want to select level three. Once you've made your selection, the zorba disk appears in the center of the field and moves in a random direction. It continues moving in that direction until it hits one of the shifters.

Shifty Characters

If the disk hits a diagonal shifter, it changes its direction by 90 degrees:



If the disk hits a shifter which is perpendicular to the direction it's moving, it reverses course:

The movement of the disk isn't affected if it hits a shifter that's parallel to its course:

Player 1 defends the vertical sides of the field, and controls a red vertical shifter beam. Moving the joystick left or right moves the beam horizontally; moving the joystick up or down rotates all the shifters vertically within the beam. The shifters can't be rotated, though, if the zorba disk is in the beam.

Player 2 defends the horizontal sides of the field, and controls a yellow horizontal shifter beam. Moving the joystick up or down moves the beam vertically; moving the joystick left or right rotates all the shifters within the beam horizontally. Again, the shifters can't be rotated if the zorba disk is in the beam.

Each time the zorba disk enters

Amplify your skills

WITH THESE NEW INTRODUCTORY BOOKS FROM COMPUTE! BOOKS.

These titles will help you unleash the power inside your computer. Whether you're an experienced programmer learning a new language or a beginner just starting out, these books will show you, clearly and quickly, how to get more than you ever thought possible from your computer.

THE AMAZING AMIGA

The Amiga: Your First Computer
Dan McNeill
Written in a lively and entertaining style, this book teaches everything a beginner needs to know to get started quickly with the Amiga from Commodore. You'll learn about setting up the system, some of the most popular types of software, and details about the hardware.
ISBN 0-87455-025-4
$16.95

Using AmigaDOS
Arlan R. Levitan and Sheldon Leemon
A comprehensive reference guide and tutorial to the powerful AmigaDOS—the operating system underlying the Workbench and Intuition—this book offers information useful to every Amiga owner. AmigaDOS, the alternative to the icon-based Workbench, lets you control the computer directly. Using AmigaDOS defines and illustrates all DOS commands, and shows you how to create file directories, access peripherals, and run batch file programs. You'll learn why the system prompts you to swap disks, and how to avoid "disk shuffle." The screen- and line-oriented text editors, both overlooked in the user's guide which comes with the Amiga, are explained in detail. Numerous examples and techniques show you how to use AmigaDOS to make operating your computer even more convenient. A full reference section details each DOS command, giving you easy access to the complete AmigaDOS.
ISBN 0-87455-047-5
$14.95

BRING THE ATARI ST ALIVE

Introduction to Sound and Graphics on the Atari ST
Tim Knight
The ST, Atari's powerful new computer, is an extraordinarily impressive sound and graphics machine. Easy to use, the ST can produce color graphics and sound. You'll find thorough descriptions of the computer's abilities, and the information needed to create a complete sound and graphics system. This is the perfect introductory reference to sound and graphics on the Atari ST.
ISBN 0-87455-035-1
$14.95

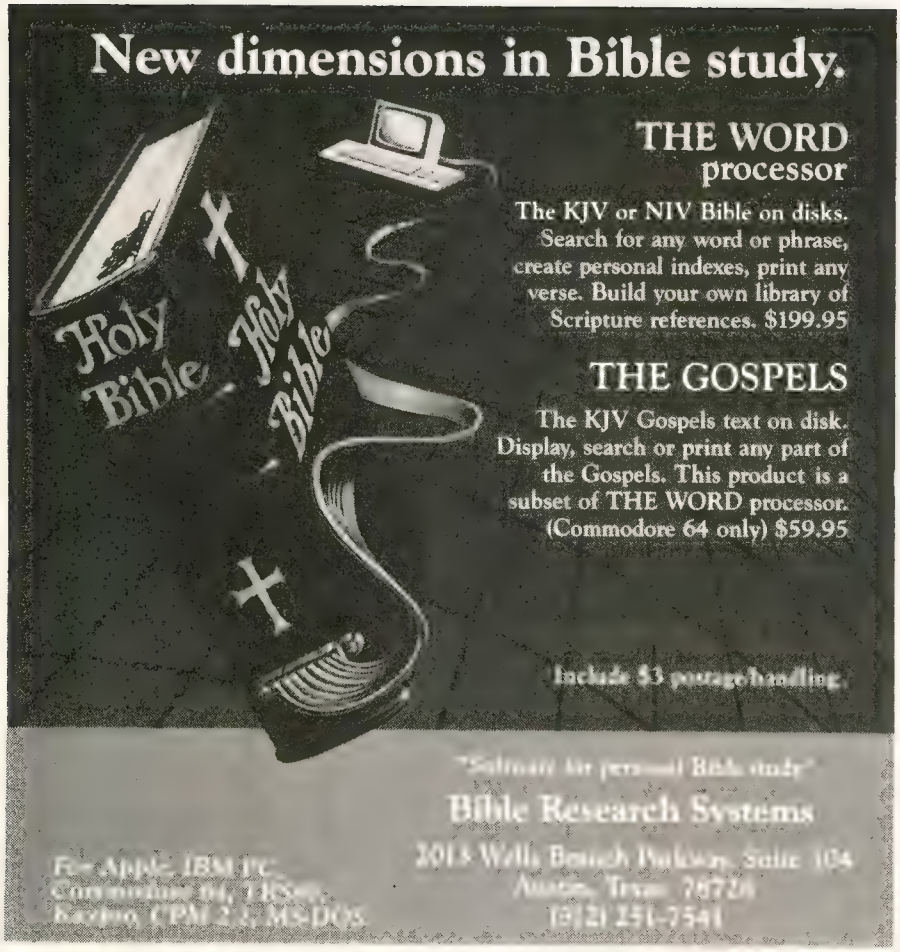
LEARN C

From BASIC to C
Harley M. Templeton
This introduction to C takes you by the hand and shows how to move from BASIC to this increasingly popular language. BASIC programmers will find this approach designed just for them. Early chapters discuss C language equivalents for common BASIC statements and the similarities and differences between BASIC and C. Later chapters teach everything you need to know to write, debug, and compile programs in C.
ISBN 0-87455-026-2
$16.95

Visit your local bookstore or computer store to purchase any of these new, exciting books from COMPUTE! Publications. Or order directly from COMPUTE!. Call toll free 1-800-346-6767 (in NY 212-265-8360) or mail your check or money order (including $2.00 shipping and handling per book) to COMPUTE! Books, P.O. Box 5038, F.D.R. Station, New York, NY 10150.

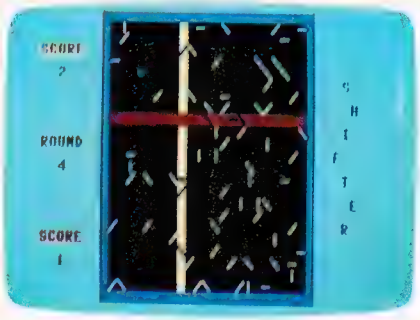
COMPUTE! Publications, Inc. abc
One of the ABC Publishing Companies
825 7th Avenue, 6th Floor, New York, NY 10019
Publishers of COMPUTE!, COMPUTE!'s Gazette, COMPUTE!'s Gazette Disk, COMPUTE! Books, and COMPUTE!'s Apple Applications

COMPUTE! books are available in the U.K., Europe, the Middle East, and Africa from Holt Saunders, Ltd., 1 St. Anne's Road, Eastbourne, East Sussex BN21 3UN, England and in Canada from Holt, Rinehart, & Winston, 55 Horner Ave., Toronto, ON M8Z 4X6.


New dimensions in Bible study.
THE WORD processor
The KJV or NIV Bible on disks. Search for any word or phrase, create personal indexes, print any verse. Build your own library of Scripture references. $199.95
THE GOSPELS
The KJV Gospels text on disk. Display, search or print any part of the Gospels. This product is a subset of THE WORD processor. (Commodore 64 only) $59.95
Include $3 postage/handling.
Bible Research Systems
2013 Wells Branch Parkway, Suite 104
(512) 251-7541

SUPERCAT
Disk Catalog System
© 1984, 1985 by Comucopia Software
Have you tried the others?
And found they lacked something?
Don't give up before you try SUPERCAT!
THE SUPER UTILITY FOR YOUR C-64 LIBRARY.
Unique Disk ID'S not necessary
Automatic Entry from Disk Directory with Manual Selection, Edit and Cross Reference
Search — find any Title in 10 seconds
Print — Alphabetized Index of all Titles, Directories by disk, Disk Labels and more
Runs on Commodore C-64 or C-128 with 1 1541 Drive / 2 1541 Drives / Dual Drives
Printer not required
Search Function defaults to the Screen
Catalogs up to 640 Disk Directories
Indexes and Alphabetizes over 5000 Titles
Sorts 1000 Titles in 8 seconds
$29.95 (U.S.) Includes shipping within USA
Includes backup copy of program disk
Add $4 for COD Orders – $6 for Shipping Outside of USA
Order your copy today!
Satisfaction guaranteed.
(503) 293-3437
Comucopia Software
P.O. BOX 2638, Portland, OR 97208-2638
Lines open 7 days/24 hours. Next day shipping on most orders. 30 day guarantee. Dealer inquiries invited.

the top or bottom side of the field, player 1 scores a point; if the disk enters the left or right side, player 2 scores. Each time a point is scored, a round is finished; the game ends after five rounds.



The blue zorba disk careens toward a shifter.

Typing It In

Type in Shifter using "The Automatic Proofreader," elsewhere in this issue. If you have a Commodore 64 or 128, type in Program 1. (The program runs in 64 mode on the 128.) If you're using a Plus/4 or 16, delete lines 30 and 550 from Program 1, and insert the replacement lines in Program 2.

Shifter is written in BASIC and machine language. The machine language is in DATA statements at the end of the program. Since even a small error in typing in this data can cause the computer to lock up, be sure to save a copy before running it.

See program listing on page 99.

COMPUTE!'s Gazette is looking for utilities, games, applications educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it, on tape or disk to:

Submissions Reviewer
COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403

Please enclose an SASE if you wish to have the materials returned.

Articles are reviewed within four weeks of submission.

$3 EACH!!!

WHY PAY MORE FOR QUALITY PROGRAMS?

The Commodore Software Association is a worldwide software organization specializing in the distribution of owner/user written software for the Commodore 64 and Commodore 128 computers. We are the lowest cost organization specializing in software for the Commodore 64 and 128 in the world!

COMMODORE SOFTWARE ASSOCIATION

Members may purchase any program from our Commodore 64/128 software catalog for Only $3.00 per program — no tricks, no gimmicks. Programs are on diskette. There are no additional charges, the price of $3.00 per program includes postage, handling and all applicable taxes.

How can you sell programs for only $3 each?
The name of the game in cutting costs is volume. Volume of membership (in the tens of thousands) and purchasing (also in the thousands). We also lower our costs with the wide range of programs we offer.

$3 programs? Are they really quality programs?
Any program submitted to us has to meet our high standards. We reject any program that does not meet high industry standards of quality and sophistication.

How many programs are available?
We currently have more than **1000** programs in our Commodore software library. Most are in our up-to-date Commodore catalog. The list grows daily as submissions pour in from around the world. Members will receive regular catalog expansions.

Programs are categorized as follows:
GAMES, MUSIC, EDUCATIONAL,
BUSINESS/FINANCIAL, HOME/PERSONAL,
TECHNICAL.

How do I get a list of programs?
Membership entitles you to our extensive software catalog with listings categorized by type of program.

What else does membership provide?
Membership entitles you to our newsletter REMarks. It contains hints, program reviews, problem solvers and tips that make using your Commodore easier and simpler, and expand its capability.

Do I have to be a programmer to benefit?
Not at all. However, if you do program and want to submit a program to our software library, we have a generous software submission system.

What does it cost to join?
Only a low membership fee of $15 per year. That entitles you to our newsletter, plus all the benefits mentioned above, and quality programs for only $3 each. What's more, we'll mail out membership materials the very same day that we receive your membership fee!

HERE ARE A FEW SAMPLE TITLES FROM OUR SOFTWARE CATALOG:

Motocross, Meteor, Star Flight, Space Patrol, Eliza, Exterminator, Boxing, Battleground, Checkers, Backgammon, Poker, Space Patrol, Helicopter Rescue, Concentration, French Tennis, Alien Ambush, Rear Assault, Vicious Circle, Freeway Fox, Shark Hunt, Moon Base, Star Trek, Trench, Mystery, Candyland, Towers of Doom, Blackjack, Keno, Kizmet, Metrics, Math Tutor, Chemistry, Physics, Spanish, Planet Facts, Super Fly, Fireball, Preschool Learning Aids, European Geography, Trivia Quiz, Credit Card Management, Calorie Calculator, Recipe File, Auto Expenses, Garden Help, Golf Handicapping, Weather Forecaster, Football Rating, Autocypher, Basketball Statistian, Home Inventory, Loan Amortization, Phone/Address List, Financial Math, Depreciation Schedule, Stock Trends, Bonds, Handicapper, Personal Banker, Mortgage Spreadsheet, Letter Writer, Budget Management, W-2 Form, 1040 Form, Annuities, Paycheck, Regression, Bowling Records, Sectional Properties, Equations, Convensions, Chi-Square, Crossover Network, Digital Logic Simulator, Factorial, Flow Chart, Filter Design, Electronic Solution, Bisection, Simpson Integration, Polyhedra Coordinates, Statistical Analysis, etc., etc., etc.

— A very small list when compared to our catalog!

MEMBERSHIP . . . $15.00

I have enclosed a check or money order for $15.00. This entitles me to your newsletter, your extensive software catalog and programs for only $3.00 each.

Name _____

Address _____

City _____

State _____ Zip _____

COMMODORE SOFTWARE ASSOCIATION
P.O. BOX 83655
LOS ANGELES, CA 90083

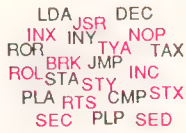
Trusted Software and

Language Software

XREF-128 & XREF-64
BASIC cross-reference

Indispensible tool for BASIC programmers. Finds all references to variables, constants & line numbers. Sorts in alphabetical order. C-64 $17.95
C-128 $17.95

ASSEMBLER/MONITOR



Macro assembler and extended monitor. Supports all standard functions plus floating point constants. Monitor supports bank switching, quick trace, single step, more. $39.95

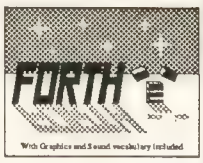
SUPER PASCAL

Full Pascal supports graphics, sprites, file management, more. Supports pointers, dynamic memory management, machine language. Compiles to fast 6510 machine code. C-64 $59.95
C-128 $59.95

SUPER C COMPILER

Full compiler, Kernighan & Ritchie standard, but without bit fields. Includes powerful editor (41K source file); compiler, library (supports many functions) and linker. C-64 $79.95
C-128 $79.95

FORTH LANGUAGE

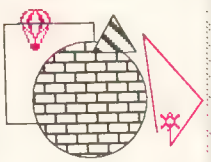


Based on Forth 79 (+ parts of '83). Supports hires graphics and sound synthesizer. Full screen editor, programming tools, assembler, samples, handbook. $39.95

MASTER

Professional development package for serious applications. Indexed file system, full screen & printer management, programmer's aid, multi-precision math, royalty-free runtime, more. $39.95

VIDEO BASIC



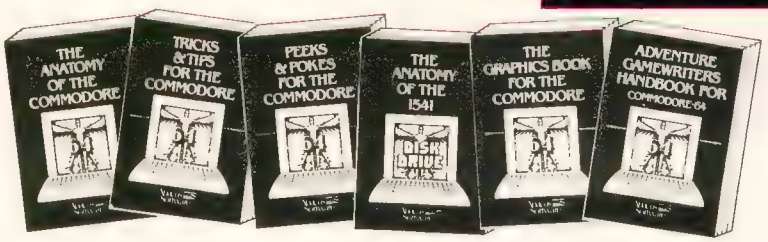
Add 50+ graphic, sound and utility commands to your programs with this super development package. Free distribution of RUNTIME version - no royalties! $39.95

ADA TRAINING COURSE

Teaches you the language of the future. Comprehensive subset of language. Includes: editor; syntax checker, compiler; assembler; disassembler, handbook. $39.95

For Commodore Computers

Reference Books


THE ANATOMY OF THE COMMODORE
TRICKS & TIPS FOR THE COMMODORE
PEEKS & POKES FOR THE COMMODORE
THE ANATOMY OF THE 1541
THE GRAPHICS BOOK FOR THE COMMODORE
ADVENTURE GAMEWRITERS HANDBOOK FOR COMMODORE 64

ANATOMY OF C-64 Insider's guide to the '64 internals. Graphics, sound, I/O, kernal, memory maps, and much more. Complete commented ROM listings. **300pp** $19.95

ANATOMY OF 1541 DRIVE Best handbook on this drive, explains all. Filled with many examples programs and utilities. Fully commented 1541 ROM listings. **500+pp** $19.95

REVISED EXPANDED

MACHINE LANGUAGE FOR C-64 Learn 6510 code & write fast programs. Many samples and listings for complete assembler, monitor and simulator. **200pp** $14.95

GRAPHICS BOOK FOR C-64 Best reference, covers basic and advanced graphics. Sprites, Hires, Multicolor, 3D-graphics, IRQ, CAD, projections, curves, more. **350pp** $19.95

TRICKS & TIPS FOR C-64 Collection of easy-to-use techniques: advanced graphics, improved data input, enhanced BASIC, CP/M, data handling and more. **275pp** $19.95

1541 REPAIR & MAINTENANCE Handbook on the drive's hardware. Includes schematics & techniques to keep 1541 running. Align drive w/ & w/o scope. Large handbook size. $19.95

ADVANCED MACHINE LANGUAGE Subjects not covered elsewhere: video controller, interrupts, timers, I/O, extensions to BASIC. Tips for the serious programmer. **210pp** $14.95

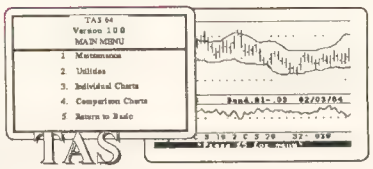
PRINTER BOOK C-64/VIC-20 Understand Commodore, Epson compatible printers & 1520 plotter. Utilities, screen dump, 3D-plot, commented MPS-801 ROM listings. **330pp** $19.95

SCIENCE/ENGINEERING ON C-64 In-depth introduction to computers in science. Some topics covered are chemistry, physics, astronomy, electronics & others. **350pp** $19.95

CASSETTE BOOK C-64/VIC-20 Make your cassette run faster than a disk drive! Cassette data-base, disk to tape backup, tape to disk, FastTape operating system. **225pp** $14.95

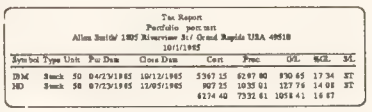
Productivity Tools

TECHNICAL ANALYSIS SYSTEM



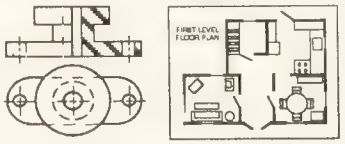
A sophisticated charting and technical analysis system for serious investors. By charting and analyzing the past history of a stock, TAS can help pinpoint trends & patterns and predict a stock's future. TAS lets you enter trading data from the keyboard or directly from online financial services. $59.95

PERSONAL PORTFOLIO MANAGER



Complete portfolio management system for the individual or professional investor. Allows investors to easily manage their portfolios, obtain up-to-the minute quotes & news, and perform selected analysis. $39.95

CADPAK



A deluxe graphics design and drawing package. Use with or without an optional lightpen to create highly-detailed designs. With dimensioning, scaling, text, rotation, object libraries, hardcopy and more. $39.95

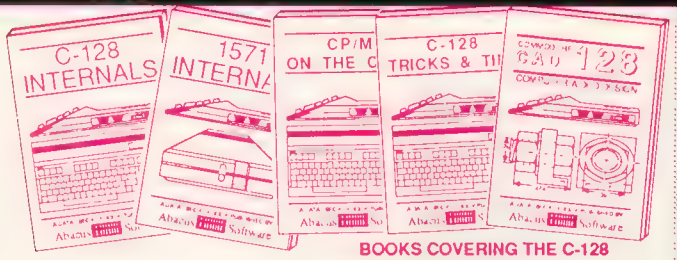
DATAMAT

Powerful, easy-to-use data management package using menu selections. Free-form design, 50 fields/record, 2000 records/disk. Sort on multiple fields in any combination. Complete selection and formatting for printing reports. $39.95

Authoritative Books

From Abacus Software

...a name you can count on



BOOKS COVERING THE C-128

IDEAS FOR USE ON C-64 Themes: auto expenses, calculator, recipe file, stock lists, diet planner, window advertising, others. Includes all program listings. 200pp $12.95

COMPILER BOOK C-64/C-128 All you need to know about compilers: how they work, creating your own and generating the final machine code. 300pp $19.95

Adventure Gamewriter's Handbook A step-by-step guide to designing and writing your own adventure games. Adventure game generator & four example games. 200pp $14.95

PEEKS & POKES FOR THE C-64 Includes in-depth explanations of PEEK, POKE, USR, and other BASIC commands. Learn the "inside" tricks about your '64. 200pp $14.95

OPTIONAL DISKETTES FOR BOOKS For your convenience, the programs contained in each of our books are available on diskette. All program thoroughly tested & error-free. Specify title of book when ordering. **$14.95 each**

C-128 INTERNALS Detailed guide presents the 128's operating system, explains the graphics chips, Memory Management Unit, and commented listing of Kernal. 500+pp $19.95

1571 INTERNALS Insiders' guide for novice and advanced users. Covers sequential & relative files, and direct access commands. Describes important DOS routines. Commented DOS listings. 500+pp $19.95

C-128 TRICKS & TIPS Chock full of info for everyone. Covers 80 column hi-res graphics, windowing, memory layout, Kernal routines, sprites and more. 300 pp $19.95

CP/M ON THE C-128 Essential guide to using CP/M on your 128. Simple explanations of the operating system, memory usage, CP/M utility programs, submit files and more. $19.95

COMPUTER AIDED DESIGN on your C-128 or 64. Create a CAD system using programs provided. Covers 3D objects & rotation, MACROS, hatching, zooming, mirroring, line widths, dashed lines, more.**300 pages** $19.95

Special Feature

BASIC 128

BASIC-128 is the *complete* compiler and development package for speeding up your BASIC programs.

BASIC-128 gives you many options: flexible memory management; choice of compiling in machine code, p-code or a mixture of both; use of a 40 or 80 column monitor; compiling in FAST-mode; etc.

The extensive 80-page programmer's guide covers: all compiler options; error handling; array dimensioning; integer loops; interrupting compiled programs; BASIC extensions; memory usage; input/output handling; 80 column hi-resolution graphics.

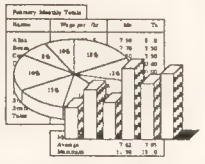
BASIC-128 is the compiler for the programmer interested in optimizing the speed and preformance of their BASIC programs and protection of their invaluable programming techniques. **C-128 $59.95**
C-64 $39.95

XPER

Capture your information on XPER's knowledge base and let this first *expert system* for Commodore computers help you make important decisions. Large capacity. Complete with editing & reporting. $59.95

POWERPLAN

One of the most powerful spreadsheets with integrated graphics for your Commodore computer. Includes menu or keyword selections, online help screens, field protection, windowing, trig functions and more. PowerGraph lets you create integrated graphs and charts from your spreadsheet data. $39.95

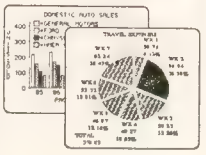


QUICKCOPY V2.0

Back up your valuable data with the fastest disk copier we've seen to date. Copies an entire disk in two and a half minutes on two drives or three and a half on one. $19.95

CHARTPAK

Make professional-quality pie, bar and line charts, and graphics from your data. Includes statistical functions. Accepts data from CalcResult and MultiPlan. C-128 has 3X the resolution of the C-64 version. Outputs to most printers. C-64 $39.95
C-128 $39.95



Ordering Information

Abacus Software

MasterCard VISA® AMERICAN EXPRESS Card

P.O Box 7211 Grand Rapids, Michigan 49510

For Postage and handling include $4.00 per order. Foreign orders include $10.00 per item. Money order and checks in U.S. Dollars only. MasterCard, VISA and American Express accected. Michigan residents please include 4% sales tax.

For *fast* service call (616) 241-5510 Telex 709-101

For **free** catalog, please return this coupon or a copy to:
Abacus Software, P.O. Box 7211, Grand Rapids, MI 49510

PHONE: (616) 241-5510

Name_____
Address_____
City_____
State_____ Zip_____

Perry Mason: The Case Of The Mandarin Murder

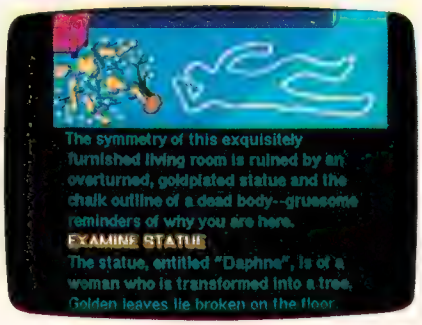
"A solution of any crime which doesn't account for all the various factors involved is no solution at all."—Perry Mason.

Erle Stanley Gardner fans will really enjoy this game for the Commodore 64 from Spinnaker Software's Telarium Series. You're cast in the role of the legendary defense attorney, Perry Mason, and prepare to defend your client, Laura Kapp, on trial for the murder of her husband, Victor, in what appears to be an open and shut case. All the evidence points to her guilt, and only your sharp legal mind and investigative skills can save her and bring the real murderer to justice. But there are plenty of other suspects, each with motives of one kind or another.

You conduct a preliminary investigation, with the help of assistants Della Street, your legal secretary, and Paul Drake, a highly-skilled private detective who has assisted you in the past. Your primary objective is to gain acquittal for your client. Before you're really ready, it's time for Laura's court appearance.

Perry Mason: The Case Of The Mandarin Murder is an interactive-fiction game, combining text and graphics. You type in your actions, and the computer responds. The parser, that part of the program which interprets your commands and questions, is rather slow for this type of game. But you'll quickly feel the sense of adventure and mystery of an Erle Stanley Gardner novel, the only difference being that *you* are part of the mystery. Your courtroom actions and decisions will determine the fate of your client.

As in other packages in the Telarium series, you may feel controlled by the program at times. Many possible avenues of investigation are blocked. Occasionally you may feel the real battle is you against the computer, rather than against the D.A. in court. Most of the investigation must be conducted by Paul, while you stay occupied with the defense in court. Often you'll find that paths of questioning you'd like to follow are blocked by seemingly pointless


The symmetry of this exquisitely furnished living room is ruined by an overturned, goldplated statue and the chalk outline of a dead body--gruesome reminders of why you are here.
EXAMINE STATUE
The statue, entitled "Daphne", is of a woman who is transformed into a tree. Golden leaves lie broken on the floor.

objections raised by District Attorney Hamilton Burger. Even trying to establish a simple relationship between characters can be quite difficult, and sometimes your questions will evoke an unexpected and unrelated response from the character.

No opportunity is given to present a defense, so you must prove the innocence of your client through careful cross-examination, and establish the guilt of the real murderer.

Most players will be able to complete this game in about four hours, with options to save and restore a game at various points along the way. After cross-examining the final witness, the jury will return a verdict: innocent, guilty, or hung jury. Arm-chair detectives will thoroughly enjoy this mystery.

—George Miller

Telarium
One Kendall Square
Cambridge, MA 02139
$32.95

Movie Maker

Have you ever wondered why Mickey Mouse wears white gloves? One story says the animated rodent was closely based on Charlie Chaplin, who was sometimes similarly attired. Another tells that Ub Iwerks, the artist who drew the mouse for Walt Disney, was inspired by the gloves worn by the painters at the animation studio who worked on the acetate cartoon cels. (A cel is the name given to each of the many transparent pictures that make up an animated cartoon.) Regardless of the legends, the mouse continues to sport his gloves. So, too, do many of the people involved in the painstaking process of conventional animation.

But as *Tron* and other movies with sophisticated animation and digitized graphics have shown, computers are having a significant impact on the traditional animation process. *Movie Maker*, a powerful animation program from Interactive Picture Systems, brings some of those computer capabilities to the Commodore 64 user. With it, the aspiring film-maker can bypass the classic method of painting and photographing thousands of cartoon cels. Instead, a finished movie of considerable length can be drawn, animated, enlivened with sound, synchronized, and recorded—all with just your computer and one disk drive.

Although *Movie Maker* has been around for some time, early copies didn't perform consistently on the 64. An enhanced version of the program is now being distributed by Electronic Arts, and it works perfectly. *Movie Maker* also contains three animated movies created by cartoonist Gahan Wilson, and a selection of art works.

Your initial point of contact is the library of effective demonstration films on the two-disk set. With these and the tutorials described in the limited documentation, it's possible to gain a bare familiarity with the program.

Beyond that, you're on your own. This is a serious product, and it's for people who really want to make animated films. Mix *Movie Maker* and your imagination, and wonders can evolve. Otherwise, it has no entertainment value. The program is an advanced animation processor, and its operation is correspondingly complex. Unless you have an understanding of how animation works, or the perseverence to grapple for a time with *Movie Maker*, think twice before buying it. For those not put off by these warnings, here's a brief look at what you can do with this excellent program.

An individual *Movie Maker* movie can have up to six video tracks and three sound tracks, all synchronized and playing concurrently. The maximum length

NRI Trains You At Home—As You Build Your Own IBM-Compatible Computer

GET THE KNOW-HOW TO REPAIR EVERY COMPUTER ON THIS PAGE.

Learn the Basics the NRI Way—and Earn Good Money Troubleshooting Any Brand of Computer

The biggest growth in jobs between now and 1995, according to Department of Labor estimates, will occur in the computer service and repair business, where demand for trained technicians will actually *double*.

You can cash in on this opportunity—either as a fulltime corporate technician or an independent service-person—once you've learned all the basics of computers the NRI way. NRI's practical combination of "reason-why" theory and "hands-on" building skills starts you with the fundamentals of electronics, then guides you through advanced electronic circuitry and on into computer electronics. You also learn to program in BASIC and machine language, the essential languages for troubleshooting and repair.

You Build—and Keep—a 16-bit Sanyo personal computer

The vital core of your training is the step-by-step building of the 16-bit Sanyo MBC-550 series computer. Once you've mastered the details of this state-of-the-art machine, you'll be qualified to service and repair virtually every major brand of computer, plus many popular peripheral and accessory devices.

With NRI training, you learn at your own convenience, in your own home. You set the pace—without classroom pressures, rigid night-school schedules, or wasted time. You build the Sanyo IBM compatible computer from the keyboard up, with your own personal NRI instructor and the complete NRI technical staff ready to answer your questions or give you guidance and special help whenever you need it.

Praised by critics as the "most intriguing" of all the IBM-PC compatible computers, the new Sanyo uses the same 8088 microprocessor as the IBM-PC and

IBM is a Registered Trademark of International Business Machine Corporation.

Epson is a Registered Trademark of Epson America, Inc.

Apple and the Apple logo are Registered Trademarks of Apple Computer, Inc

Compaq is a Registered Trademark of COMPAQ Computer Corporation.

© 1984 AT&T Technologies, Inc.

AND MORE.

features the MS/DOS operating system. As a result, you'll have a choice of thousands of off-the-shelf software programs to run on your completed Sanyo.

Your NRI course includes installation and troubleshooting of the "intelligent" keyboard, power supply, and disk drive, plus you'll check out the 8088 microprocessor functions, using machine language. You'll also prepare the interfaces for future peripherals such as printers and joysticks.

100-Page Free Catalog Tells More

Send the coupon today for NRI's big 100-page color catalog on NRI's electronics training, which gives you all the facts about NRI courses in Microcomputers, Robotics, Data Communications, TV/Video/Audio Servicing, and other growing high-tech career fields. If the coupon is missing, write to NRI Schools, 3939 Wisconsin Avenue, NW, Washington, DC 20016.

Your NRI course includes the Sanyo 16-bit IBM compatible computer with 128K RAM, monitor, double density/double sided disk drive, and "intelligent" keyboard; the NRI Discovery Lab®, teaching circuit design and operations; a Digital Multimeter; Bundled Spread Sheet and Word Processing Software worth over $1000 at retail—and more.

NRI SCHOOLS
McGraw-Hill Continuing Education Center
3939 Wisconsin Avenue, Washington, DC 20016
We'll give you tomorrow.

For Career courses approved under GI bill, ☐ check for details.

☑ **CHECK ONE FREE CATALOG ONLY**

- ☐ **Computer Electronics with Microcomputers**
- ☐ Data Communications
- ☐ Robotics & Industrial Controls
- ☐ Video Electronics Servicing
- ☐ Electronic Design Technology
- ☐ Digital Electronics
- ☐ Satellite Communications
- ☐ Communications Electronics
- ☐ Industrial Electronics
- ☐ Basic Electronics
- ☐ Telephone Servicing
- ☐ Small Engine Servicing
- ☐ Appliance Servicing
- ☐ Automotive Servicing
- ☐ Air Conditioning, Heating, Refrigeration, & Solar Technology
- ☐ Building Construction
- ☐ Locksmithing & Electronic Security

Name (Please Print) Age

Street

City/State/Zip Accredited by the National Home Study Council 153-036

Melodian will teach you to play, compose,

A True Breakthrough In Music Education

At last, a program that makes it not only easy but fun to learn music. The Melodian keyboard and software were designed by Harry Mendell who designs custom synthesizer electronics and software for professional musicians such as **Stevie Wonder** and Eric Himy, an award winning concert pianist. The Melodian boasts many of the professional features found only on more expensive equipment. These features include multitrack recording, the ability to create custom instrument sounds and most importantly, ease of use.

Start your lesson with **RhythmMaster** Software. With its built-in metronome, RhythmMaster will display the treble and bass musical staffs and a picture of a piano keyboard. RhythmMaster will then play a measure of music and you must try to play the same measure back on the Melodian keyboard. You're not familiar with the keyboard or can't read music? No problem. RhythmMaster displays the notes you are to play on the musical staff and on the keyboard pictured on the monitor. If you strike the wrong key the note on the musical staff turns red and shows you which key you played wrong, making it ever so easy to correct what you played.

If you should hold a key too long a turtle runs across the screen. Inversely if you should release a key too quickly a rabbit scurries by. If you don't play it correctly RhythmMaster knows it and repeats the measure for you to play.

ConcertMaster teaches you how to play 35 pre-recorded songs from Bach to Rock. With ConcertMaster you can analyze music note by note, instrument by instrument and learn how a music composition is put together. Then you can compose your own music and record it right onto your floppy disks.

There are nineteen different instrument sounds to choose from in over a seven octave range giving you a wide choice of instruments to suit your musical taste and expression. You can also create your own instrument sounds.

ScoreMaster enables you to print out your music in standard music notation for other musicians to play, or for yourself.

New York Times Says . . .

Erik Sandberg-Diment of the New York Times states "really useful and instructive item ... Tanya, our 10 year old beginner quickly caught the spirit of matching the dance of her fingers to the measured metronome." "One piece of educational software that, unlike most of its kinfolk, actually delivers. These software-hardware combinations offer a lot of entertainment to the Commodore owner."

RUN Magazine Says . . .

Tom Benford of RUN notes "Whenever a selection of products of the same genre is available, one among the bunch rises head and shoulders above the rest. Such is the case with Melodian ConcertMaster keyboard and software. The combined features of RhythmMaster and ConcertMaster give you a complete music tutorial."

AHOY! Magazine Says . . .

Peggy Herrington of AHOY! said "The system is so easy to use that I didn't need the documentation". "It's fun, challenging, and educational, and for playability and ease of use it is nothing short of spectacular."

Satisfaction Guaranteed When You Buy Direct

By selling directly to you, we are able to give you the Melodian Keyboard and Software at far lower prices than ever offered before. You take no risk. **If the Melodian keyboard or any of the programs don't please you, for any reason whatsoever, send it back within 60 days for a full refund!**

MELODIAN™

The new, fast way to learn, play and compose music.

PLEASE SEND ME:

- ☐ Melodian Keyboard $99.95
- ☐ RhythmMaster $29.95
- ☐ ConcertMaster $29.95
- ☐ ScoreMaster $29.95
- ☐ Programmer's Tool Kit $29.95

Add $5.00 Shipping per keyboard

60 DAY MONEY-BACK GUARANTEE

Recordings:

- ☐ Christmas Carols $12.95
- ☐ Nutcracker Suite $12.95
- ☐ Bach's Hits $12.95
- ☐ Classical Favorites $12.95
- ☐ Demonstration Disk $9.95

Amount (FL 5% tax)

Payment AMEX, VISA, MC BankDraft Check

Credit Card Expir Date /

Card #

Name

Shipping Address

City

State Zip

Telephone

COD's and Purchase Orders WILL NOT be accepted by Melodian. Florida residents add 5% sales tax. Please allow one week for delivery

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

First Class Permit No. 8917 Ft Lauderdale, FL 33310-9990

POSTAGE WILL BE PAID BY ADDRESSEE

MELODIAN SYSTEMS INC.
P.O. BOX 8857
FORT LAUDERDALE, FL 33310-9990

and record music in just one evening!!

RhythmMaster Software rm-01 — $29.95

RhythmMaster teaches a beginner how to read music and play it correctly and in rhythm on the musical keyboard.

RhythmMaster will have you reading and playing musical notes in minutes with fun and excitement.

RhythmMaster Features:

Trumpet, organ, violin, and synthesizer instrument sounds. Built in metronome. Pause/Play control. Set-up menu for customizing RhythmMaster.

RhythmMaster Teaches:

How to read notes on the treble and bass musical staffs,the names of the notes, where the notes are on the keyboard how to play whole notes, half notes, quarter notes, eighth notes and sixteenth notes in combinations, in both 3/4 and 4/4 time. How to play in different tempos.

RhythmMaster Requires:

A Commodore 64 or Commodore 128 with disk drive. Melodian Musical Keyboard kb-01 is required to study the reading and playing of musical notes.

Melodian Musical Keyboard kb-01 — $99.95

40 Keys (A-C) in professional gauge spring loaded to give the feel and response of a real keyboard instrument. Polyphonic.

Registers (with ConcertMaster)
Organ, Trumpet, Flute, Clarinet, Piano, Harpsicord, Violin, Cello, Bass, Banjo, Mandolin, Calliope, Concertino, Bagpipe, Synthesizer 1, Synthesizer 2, Clavier 1, Clavier 2, which can be played over a 7 octave range. Programmable sounds as well.

Recording (with ConcertMaster)
Three track sequencer (recorder) with overdubbing and multitimbral (different instrument sounds at the same time) effects.

Interface
Built in interface for Commodore 64, Commodore 128, plugs right in to joystick port no. 2 and user port.

Power Supply
Powered direct by the computer, no batteries and cords required.

Finish
Table Model in white high-impact material, with carrying handle, protective key cover, and built in music stand. Size 29 -1/8 X 9-9/16 X 5-11/16, weighs 9 pounds.

Programmer's Tool Kit pt-01 — $29.95

Contains programs, and BASIC source listings for reading the Melodian Musical Keyboard, and for reading and creating music files for Melodian ConcertMaster.

ConcertMaster Software cm-01 — $29.95

ConcertMaster teaches how a composition is put together, note by note, instrument by instrument. You learn to play 35 pre-recorded songs from Bach to Rock. Then you can compose your own songs and record them right onto your floppy disk.

ConcertMaster Teaches:

Scales, Bass lines, Familiar Beginner Songs such as "Jingle Bells", Easy classical songs such as "Bach Minuet" and Ravel's "Bolero", Advanced classics like "A Midsummer's Night Dream" by Mendelssohn, Popular hits such as "Thriller"

Instruments Sounds

Organ, Trumpet, Flute, Clarinet, Piano, Harpsicord, Violin, Cello, Bass, Banjo, Mandolin, Calliope, Concertina, Bagpipe, Synthesizer 1, Synthesizer 2, Clavier 1, Clavier 22, which can be played over a 7octave range. Programmable sounds as well.

Recording Functions:

Three track sequencer (recorder) with overdubbing and multitimbral (different instrument sounds at the same time) effects.
Each track can be set to one of seven different functions:

- **Monitor:** Lets you use a track to play music live, without recording it.
- **Record:** Records a track as you play.
- **Playback:** Lets you hear whatever has been recorded or loaded into the track. You may playback one track while recording another to build layers of instruments.
- **Mute:** Turns a track off. This is useful when you want to listen to or record one or two tracks at a time.
- **Save:** Stores a track to the disk.
- **Load:** Loads a track from the disk.
- **Protect:** Write protects a track.

Create New Instrument Sounds

Choose from pulse, sawtooth, triangle and noise sound sources. Control the sound envelope with attack, decay, sustain, and release times. Ring Modulation and Syncronization effects. Set Low pass, band pass, and high pass filter frequencies.

ConcertMaster Requires:

A Commodore 64 or Commodore 128 with disk drive. Melodian Musical Keyboard kb-01 is required to study the reading and playing of musical notes.

Melodian ScoreMaster sm-01 — $29.95

With the ScoreMaster program your music can be printed out in music notation, which other musicians can read and play. Any music recorded with the ConcertMaster program can be printed by ScoreMaster.

ScoreMaster Requires:

A Commodore 64 or Commodore 128 with disk drive and printer compatible with the Commodore graphics mode such as the Commodore MPS 803, 1515, and 1525.
Melodian ConcertMaster program.

ACCESSORIES

Headphones	$12.95
Stereo Cables	$ 9.95
Demonstration Disk	$ 9.95

RECORDINGS

Christmas Carols	$12.95
Tchaikowsky Nutcracker	$12.95
Bach's Hits	$12.95
Classical Favorites	$12.95

FOR CREDIT CARD ORDERS, CALL TOLL-FREE

1-800-327-4566

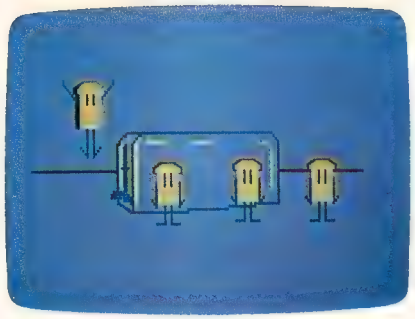
IN FLORIDA, CALL 1-800-351-8777

For our International customers: Please send credit card number or international money order in U.S. dollars, or call **305-979-3777.** For Canada and Mexico, add $15.00 for air mail. Overseas add $16.00 for surface mail, and $70.00 for air mail.

MELODIAN™

The new, fast way to learn, play and compose music.

© 1985, Melodian, Inc., 970 W. McNab Rd., Fort Lauderdale, FL 33309. All rights reserved.



of a movie is 300 frames, and the maximum size of a character is one-eighth of the screen. The video tracks can each display one character at a time, but that character can be pulled off the screen and replaced with another at any point. Lower numbered tracks pass behind higher numbered ones. All tracks play over a static background page. Recording is simple and easy—once you've found your own method—and adding great sound effects is a snap. But doing all of this effectively is far from easy, and you'll need to experiment with the program to find a consistently successful approach.

You start in the Compose option, selected from an integrated system of menus like the other features of the program. Here you'll work on a shape page and a background page. The former carries all the drawings of your characters, the latter just what you'd expect. In both, three different colors can be selected and drawn on a fourth. Your drawing tools aren't fancy by comparison to specialized graphics programs, but they are adequate. The duplicate, zoom, and mirror commands are good— and essential, since you must draw every frame of every character's movement.

You work with the program via a system of windows, borders, outlines, numerous keypresses, and a joystick. Frankly, this can be quite confusing until you realize that only those items outlined by narrow boxes are really "seen" by *Movie Maker*. You set up these boxes yourself; and you can toggle them on and off by pressing the letter V on the keyboard. Anything you dump into such a box is manageable by one command or another. Since the commands are accessed by varied keypresses, it's quite easy to lose your place. Above all, remember that pressing the space bar in Compose will eventually return you to a stable situation—you'll see a character outlined by one thin box, and you can begin manipulating your drawings again. Eventually, you combine your figures into an animation sequence by merely surrounding them with a box and pressing the joystick fire button. These sequences are held in memory, and can be put in motion and perfected. The shape and background pages are then stored to disk.

From the creative stage of Compose, you move to Record. Here, you recall your shape and background files and record the sequences as a movie. It's not easy at first, but eventually you'll be mixing tracks and characters, sound and special effects with little effort. Program operation is much like that in Compose. Again the object is to produce a disk file, this time an animation file.

Next you'll go to Smooth. This is an automatic section of the program which melds all your files into a smooth-running short film.

The final stage of the program, Play, plays your completed movie. Again, this is a largely automatic process.

There are numerous specialized features packed into *Movie Maker*, but they won't mean much until you use them. Of special interest, though, is the ability to make auto-run disks that will play your movie on any 64. You can, of course, splice your short films into a long videotape, and perhaps rival those early productions of Disney and Iwerks.

Indeed, for anyone wanting to make good quality animation without a studio laden with equipment, *Movie Maker* offers plenty of scope. The program's complexities can be overcome, leaving you with an effective and useful tool for what is, after all, a very involved process. Now you can throw away the white gloves and get to grips directly with the film making.

—Lee Noel, Jr.

Electronic Arts
(Designed by Interactive Picture Systems)
2755 Campus Drive
San Mateo, CA 94403
$32.95

Dambusters

It's World War II, and the German war machine is in high gear, providing Hitler with the tanks, boats, and planes needed to carry out his plans for world domination. The power source for virtually all of Germany's industry comes from three huge dams in the Ruhr Valley—the Moehne, the Sorpe, and the Eder. Destroy these dams, and the German war machine will be crippled. Your mission is as obvious as it is vital, and as vital as it is dangerous: destroy the dams.

That's the scenario, based upon the actual raid carried out during WWII, that serves as the basis for Accolade's new war/flight simulator, *Dambusters*. Accolade is a relatively new software company, and its products stress realism, stunning graphics, innovative concepts, and enjoyment: *Dambusters*, at least the Commodore 64 version, fits the bill.

Dambusters is a combination flight

simulator/wargame. It requires you to not only recreate the bombing raid on the great dams inside Nazi Germany but also to pilot the Lancaster Bomber while doing so. Using realistic joystick control, you must learn to read and respond to various pilot screens and indicators, navigational maps, and engineer's indicators. At the same time, you control the front and rear gunners, and—of course—the bomb sights. After all, you didn't think the Germans were going to just let you walk in and destroy their dams, did you?

Flying at low level (you've got to drop your 10,000 pound package from no more than 60 feet above the water), be prepared for a deadly greeting party made up of German ME-110 night fighters. They'll show up at about the same time you're dodging or shooting down barrage balloons and spotlights. Of course, you're going to get some flak from the Germans on the ground, too.

As a flight simulator, *Dambusters* isn't as complicated as *Flight Simulator II* or *Stunt Pilot*, two advanced computer flight simulators; however, it does require an understanding and constant awareness of booster gauges, throttles, RPM gauges and the altimeter gauge. As a game, *Dambusters* doesn't contain as much variety as, say, *Fifty Mission Crush*, another flight-based contest. Nevertheless, when you combine the two aspects and throw in a very demanding final bombing run, you have an excellent game.

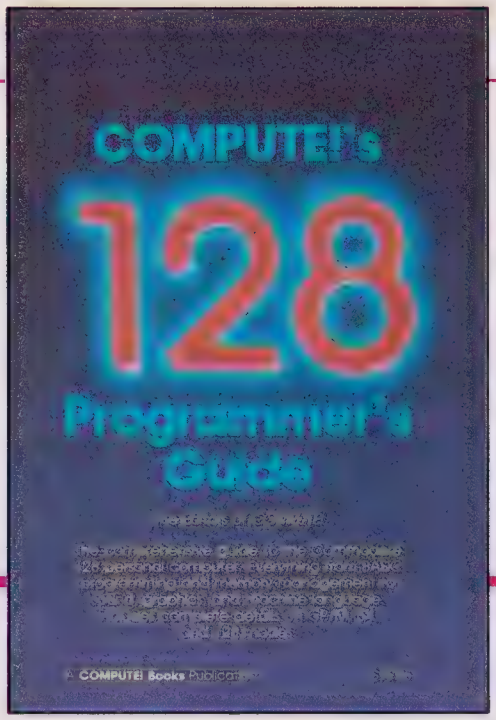
Graphics are very well done. It's a visual reward to see your bomb skipping along the water's surface, disappearing from sight, and then blowing a huge hole in one of the dams, releasing a cascade of water. (It probably should be mentioned, even though this is a Commodore review, that while the game play is the same on the Apple II version, the graphics are not nearly as good).

All in all, this product offers good play value for the dollar, and its approach is different enough to make it more than just another flight simulator or WWII flying game.

—James Trunzo

Accolade, Inc.
20863 Stevens Creek Boulevard
Cupertino, CA 95014
$34.95

COMPUTE!'s PROGRAMMER'S GUIDES



Everything you need for successful, entertaining, and challenging programming on your Amiga, Atari ST, or Commodore 128 computer.

Each book is carefully written in COMPUTE!'s lively, understandable style to help even beginning programmers learn the ins and outs of their personal computers.

COMPUTE!'s 128 Programmer's Guide

ISBN 0-87455-031-9
Editors of COMPUTE! 464 pages

Written and compiled by the most technically proficient authors in consumer computing today, the technical staff of COMPUTE! Publications, this guide to the powerful Commodore 128 computer contains a wealth of information for every programmer. Explore BASIC 7.0 through countless hands-on examples and sample programs. Learn how to create dazzling graphics and sophisticated sounds in both BASIC and machine language. See how to program peripherals, such as disk drives, printers, and modems. Enter the world of CP/M, just one of the three modes of the 128. There are even chapters introducing you to machine language programming and the computer's method of managing memory. *COMPUTE!'s 128 Programmer's Guide* includes numerous appendices covering everything from error messages to memory maps.

$16.95

COMPUTE!'s ST Programmer's Guide

0-87455-023-8
Editors of COMPUTE!

Complete and comprehensive, yet easy to understand, *COMPUTE!'s ST Programmer's Guide* is a must-buy for any Atari ST owner. The technical staff of COMPUTE! Publications has put together a reference guide to programming that takes the reader through every aspect of this newest Atari personal computer. Logo and BASIC, the two programming languages now available for the machine, are explored in detail. From programming concepts to writing programs, the scores of ready-to-type-in examples show just what can be done, and how to do it. Advanced features of this new-generation computer, such as GEM and TOS, the ST's user interface and operating system, are illustrated as readers write their own applications. Valuable appendices provide information programmers need, including GEM VDI opcodes and a list of ST resources.

$16.95

COMPUTE!'s Amiga Programmer's Guide

0-87455-028-9
Edited

Covering AmigaDOS, BASIC, Intuition, and the other important programming tools which accompany the new Amiga, *COMPUTE!'s Amiga Programmer's Guide* is a clear and thorough guide to the inner workings of this fascinating, new-generation computer. The great speed of its 68000 microprocessor, coupled with the versatility of the Amiga-specific graphics and sound chips, makes the Amiga one of the most powerful computers available today. Written by the technical staff of COMPUTE! Publications, the most technically knowledgeable authors in computing today, this book is your key to accessing the Amiga's speed and power.

$16.95 (March Release)

Look for these new books at a bookstore or a computer store near you. Or order directly from COMPUTE! Books. Call toll-free 1-800-346-6767. In NY call 212-887-8525.

COMPUTE! Publications, Inc.
One of the ABC Publishing Companies

COMPUTE! books are available in the U.K., Europe, the Middle East, and Africa from Holt Saunders, Ltd., 1 St. Anne's Road, Eastbourne, East Sussex BN21 3UN, England.

COMMODORE 64 COMPUTER

(Order Now)

$139.95

- **C128 Disks 79¢ ea.***
- **Paperback Writer 64 $34.95**
- **10" Comstar 10X Printer $148.00**
- **13" Zenith Color Monitor $139.95**

CALL BEFORE YOU ORDER

COMMODORE 64 SYSTEM SALE

Commodore 64

Com. 1541 Disk Drive

13" Color Monitor

Plus $30.00 S&H

$457

PLUS FREE $49.95 Oil Barons Adventure Program

C128 COMMODORE COMPUTER

NEW

(Order Now)

$289.00

Plus FREE $69.95 Timeworks Wordprocessor.

- **340K 1571 Disk Drive $259.00**
- **Voice Synthesizer $39.95**
- **12" Amber Monitor $79.95**

PRICES MAY BE LOWER

COMMODORE 64 COMPUTER $139.95

You pay only $139.95 when you order the powerful 84K COMMODORE 64 COMPUTER! LESS the value of the SPECIAL SOFTWARE DISCOUNT COUPON we pack with your computer that allows you to SAVE OVER $250 off software sale prices!! With only $100 of savings applied, your net computer cost is $39.95!!

* C128 DOUBLE SIDED DISKS 79¢ EA.

Get these 5¼" Double Sided Floppy Disks specially designed for the Commodore 128 Computer (1571 Disk Drive). 100% Certified, ***Lifetime Warranty***. Automatic Lint Cleaning Liner included. 1 Box of 10 - $9.90 (99¢ ea.), 5 Boxes of 10 - $44.50 (89¢ ea.), 10 Boxes of 10 - $79.00 (79¢ ea.).

13" ZENITH COLOR MONITOR $139.95

You pay only $139.95 when you order this 13" ZENITH COLOR MONITOR. LESS the value of the SPECIAL SOFTWARE DISCOUNT COUPON we pack with your monitor that allows you to save over $250 off software sale prices!! With only $100 of savings applied, your net color monitor cost is only $39.95. (16 Colors).

Premium Quality 120-140 CPS Comstar 10X Printer $148.00

The COMSTAR 10X gives you a 10" carriage, 120-140 CPS, 9 x 9 dot matrix with double strike capability for 18 x 18 dot matrix (near letter quality), high resolution bit image (120 x 144 dot matrix), underlining, back spacing, left and right margin setting, true lower decenders with super and subscripts, prints standard, italic, block graphics and special characters. It gives you print quality and features found on printers costing twice as much!! (Centronics Parallel Interface) List $399.00 **Sale $148.00.**

4 SLOT EXPANDER & 80 COLUMN BOARD $59.95

Now you program 80 COLUMNS on the screen at one time! Converts your Commodore 64 to 80 COLUMNS when you plug in the 80 COLUMN EXPANSION BOARD!! PLUS 4 slot expander! ***Limited Quantities***

80 COLUMNS IN COLOR PAPERBACK WRITER 64 WORD PROCESSOR $39.95

This PAPERBACK WRITER 64 WORD PROCESSOR is the finest available for the COMMODORE 64 computer! The ULTIMATE FOR PROFESSIONAL Word Processing, DISPLAYS 40 or 80 COLUMNS IN COLOR or black and white! Simple to operate, powerful text editing, complete cursor and insert/delete key controls line and paragraph insertion, automatic deletion, centering, margin settings and output to all printers! List $99.00. **SALE $39.95.** Coupon $29.95.

SPECIAL SOFTWARE COUPON

We pack a SPECIAL SOFTWARE DISCOUNT COUPON with every COMMODORE 64 COMPUTER, DISK DRIVE, PRINTER, or MONITOR we sell! This coupon allows you to SAVE OVER $250 OFF SALE PRICES!!

(Examples)

PROFESSIONAL SOFTWARE COMMODORE 64

Name	List	Sale	Coupon
Paperback Writer 64	$99.00	$39.95	$29.95
Paperback Database 64	$69.00	$34.95	$24.95
Paperback Dictionary	$24.95	$14.95	$10.00
The Print Shop	$44.95	$27.95	$26.95
Halley's Project	$39.95	$25.95	$24.95
Practicalc (spread sheet)	$59.95	$19.95	$14.95
Programmers Reference Guide	$24.95	$16.95	$12.50
Nine Princes in Amber	$32.95	$24.95	$21.95
Super Bowl Sunday	$30.00	$19.95	$17.95
Flip & File Disk Filer	$24.95	$14.95	$12.95
Deluxe Tape Cassete (plus FREE game)	$89.00	$44.95	$34.95
Pro Joystick	$19.95	$12.95	$10.00
Computer Care Kit	$44.95	$29.95	$24.95
Dust Cover	$ 8.95	$ 6.95	$ 4.60
Injured Engine	$39.95	$27.95	$24.95
Pitstop II (Epyx)	$39.95	$22.95	$19.95
Music Calc	$59.95	$14.95	$12.95
File Writer (by Codewriter)	$39.95	$29.95	$24.95

(See over 100 coupon items in our catalog)

Write or call for Sample SPECIAL SOFTWARE COUPON!

ATTENTION

Computer Clubs

We Offer Big Volume Discounts

CALL TODAY!

PROTECTO WARRANTY

All Protecto's products carry a minimum 90 day warranty. If anything fails within 90 days from the date of purchase, simply send your product to us via United Parcel Service prepaid. We will IMMEDIATELY send you a replacement at no charge via United Parcel Service prepaid. This warranty proves once again that ***We Love Our Customers.***

C128 COMMODORE COMPUTER $289.00

We expect a limited supply for Christmas. We will ship on a first order basis. This all-new revolutionary 128K computer uses all Commodore 64 software and accessories plus all CPM programs formatted for the disk drive. ***Plus FREE $69.95 Timeworks Wordprocessor.*** List $349.00. **SALE $289.00.**

340K 1571 COMMODORE DISK DRIVE $259.00

Double Sided, Single Disk Drive for C-128 allows you to use C-128 mode plus CPM mode. 17 times faster than 1541, plus runs all 1541 formats. List $349.00. **Sale $259.00.**

SUPER AUTO DIAL MODEM $29.95

Easy to use. Just plug into your Commodore 64 computer and you're ready to transmit and receive messages. Easier to use than dialing your telephone, just push one key on your computer! Includes exclusive easy to use program for up and down loading to printer and disk drives. ***Best in U.S.A.*** List $99.00. **SALE $29.95.** *Coupon $24.95.*

VOICE SYNTHESIZER $39.95

For Commodore-64 computers. Just plug it in and you can program words and sentences, adjust volume and pitch, make talking adventure games, sound action games and customized talkies!! PLUS ($19.95 value) TEXT TO SPEECH program included FREE, just type a word and hear your computer talk — ADD SOUND TO "ZORK", SCOTT ADAMS AND OTHER ADVENTURE GAMES!! (Disk or tape.) List $89.00. **SALE $39.95**

12" MAGNAVOX (NAP) 80 COLUMN MONITOR WITH SOUND $79.95

Super High Resolution green screen monitor. 80 columns x 24 lines, easy to read, plus speaker for audio sound included. Fantastic value List $129.00 **Sale $79.95.** (C128 cable $19.95. C64, Atari cable $9.95)

PRINTER/TYPEWRITER COMBINATION $229.95

"JUKI" Superb letter quality, daisy wheel printer/typewriter combination. Two machines in one — just a flick of the switch. 12" extra large carriage, typewriter keyboard, automatic margin control and relocate key, drop in cassette ribbon! (90 day warranty) centronics parallel or RS232 serial port built in (Specify). List $349.00. **SALE $229.95. (Ltd. Qty.)**

13" RGB & COMPOSITE COLOR MONITOR $259.95

Must be used to get 80 columns in color with 80 column computers (C128 - IBM - Apple). (Add $14.50 shipping) List $399.00. **SALE $259.95.**

- **LOWEST PRICES • 15 DAY FREE TRIAL**
- **BEST SERVICE IN U.S.A. • ONE DAY EXPRESS MAIL**

PHONE ORDERS
8 a.m. - 8 p.m. Weekdays
9 a.m. - 12 noon Saturdays

- **90 DAY FREE REPLACEMENT WARRANTY**
- **OVER 500 PROGRAMS • FREE CATALOGS**

Add $10.00 for shipping, handling and insurance. Illinois residents please add 6% tax. Add $20.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES EXCEPT CANADA. Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail! VISA — MASTER CARD — C.O.D. No C.O.D. to Canada, APO-FPO

PROTECTO

We Love Our Customers

Box 550, Barrington, Illinois 60010

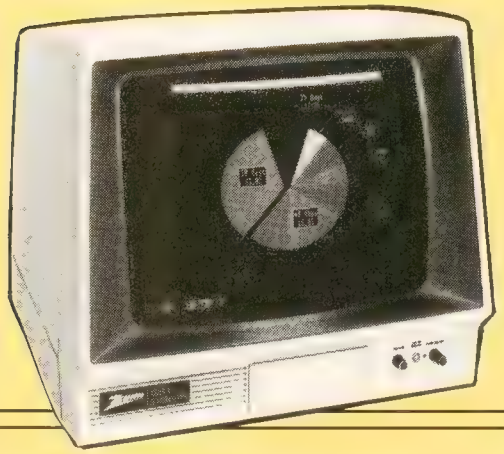
312/382-5244 to order

Computer Cleaners

Your Choice Reg. $19.95 **Sale $9.95**

½ PRICE SALE

Your Choice Reg. $19.95 **Sale $9.95**



TV/MONITOR SCREEN RESTORER & CLEANING KIT

Sale $9.95

Reduce eye fatigue by increasing the clarity of your TV or monitor screen. This kit contains a hard wax formulation to cover surface imperfections on TV screens and monitors. This restores maximum optical clarity, making what you see more distinct. Plus high absorbency cloths and an auto static spray cleaner allows you to clean your screen on a regular basis to keep your screen looking better than new. (This is a must for those who watch monitors or TVs for extended lengths of time.) List $19.95. **Sale $9.95.**

DISK DRIVE CLEANER

Reg. $19.95.
Sale $9.95.

- 60% of all drive downtime is directly related to poorly maintained drives.
- Drives should be cleaned each week regardless os use.
- Drives are sensitive to smoke, dust & all micro patricles.
- Systematic operator performed maintenance is the best way of ensuring error free use of your computer system.

This unique twin slot jacket design gives twice as many "wet-dry" cleanings per rotation as other leading brands. Non abrasive, 100% lint free, random fiber cleaners capture dust, smoke particles and disk oxide build up which insures you against disk and data loss from dirty disk drive heads just like you must clean your albums and tape players you must clean your disk drive heads to keep your disk drive working well. (24 cleanings per kit.) List $19.95. **Sale $9.95.**

ANTI-STATIC KEYBOARD CLEANER

Sale $9.95

Now you can clean your computer keyboard fast, efficiently, and safely. The keyboard cleaning solution is exclusively formulated to remove skin oils, dust, and dirt that can destroy your equipment. Plus this non residue solution with anto-static properties will not build up like ordinary household cleaners so you can clean as much as you like without worry. Plus the lint free, high absorbency, non-abrasive cloths will not scratch or mar your equipment as they pick up dirt and grime in a matter of seconds.
List $19.95. **Sale $9.95.**

Add $17.50 for shipping, handling and insurance. Illinois residents please add 6% tax. Add $35.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA.
Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!
VISA — MASTER CARD — C.O.D.
No C.O.D. to Canada, APO-FPO.

PROTECTO

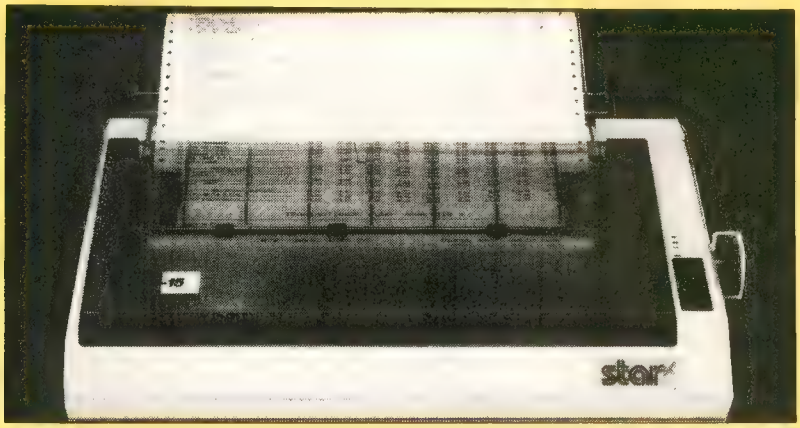
We Love Our Customers

22292 N. Pepper Rd., Barrington, Illinois 60010

312/382-5244 to order

EXTRA WIDE 15" + 120 CPS PRINTER SALE 160 CPS

• One Year Immediate Replacement Warranty **• 15 Day Free Trial**



Comstar 15½X

$229.00

120-140 CPS List $499.00

• Tractor/Friction Printer • Dot Matrix, Impact, Prints Single Sheets or Continuous Feed Paper, 15½" Carriage • Print Buffer • 9 x 9 Dot Matrix, Double Strike • Near Letter Quality, High Resolution Dot Bit Image • Underlining, Left-Right Margin • True Low Descenders, Super and Subscript • Prints Standard, Block Graphics & Italics • Centronics Parallel Interface

(IBM — Commodore) **COMSTAR 15½X SPECIFICATIONS** (Apple — Atari — Etc.)

Print Size
10, 12, 17, 5, 6, 8.5 CPI

Number of Columns
136, 164, 232 (68, 82, 116 Double Width)

Character Fonts
Normal (10 CPI); Elite (12 CPI); Condensed (17 CPI); Enlarged (5, 6, 8.5 CPI); Emphasized; Double Strike; Super & Sub Script

Character Sets
96 Standard ASCII, 32 Block Graphic, 96 Italics Characters

Cartridge Ribbon. List $6.95. **Sale $4.95.**

15" Printers use 10" and 15" Paper

CANON 15" Printer

$259.00

List $699.00

160 CPS + Letter Quality Mode

• Programmable Characters
• 2K Buffer • 15 Day Free Trial

(IBM — Commodore) **CANON SPECIFICATIONS** (Apple — Atari — Etc.)

Printing Method
Impact dot matrix

Printing Speed
160 CPS at standard character printing
27 CPS at NLQ character printing

Printing Characters
Standard 11 x 9 dot matrix
NLQ 23 x 18 dot matrix
Character set: Full ASCII character set (96), 32 special European characters

Print Buffer
2K-byte utility buffer

Image Printing
Horizontal 120 dots/inch (double density)
Horizontal 240 dots/inch (quadruple density)

Interface
8-bit parallel interface (Centronics type)

Paper
Plain paper, Roll paper, Single sheet, Fanfold, Multipart paper: max. 3 sheets

Ink Ribbon Cartridge — Sale $14.95
Ribbon Life: 3 million characters/cartridge

Maximum Number of Characters

Standard:	10 cpi	80 cpl
Enlarged:	5 cpi	40 cpl
Condensed:	17.1 cpi	136 cpl
Condensed enlarged:	8.5 cpi	68 cpl
Elite:	12 cpi	96 cpl
Elite enlarged:	6 cpi	48 cpl
NLQ pica:	10 cpi	80 cpl
NLQ pica enlarged:	5 cpi	40 cpl

Interfaces

IBM $89.00 **Apple $59.00** **Atari $59.00** **Commodore $39.00**

Add $17.50 for shipping, handling and insurance. Illinois residents please add 6% tax. Add $35.00 for CANADA, PUERTO RICO, HAWAII, ALASKA, APO-FPO orders. Canadian orders must be in U.S. dollars. WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery, 2 to 7 days for phone orders, 1 day express mail!

VISA — MASTER CARD — C.O.D.

No C.O.D. to Canada, APO-FPO.

PROTECTO

We Love Our Customers

22292 N. Pepper Rd., Barrington, Illinois 60010

312/382-5244 to order

Famous Smith Corona National Brand

10" PRINTER SALE

Below Wholesale Cost Prices!!!

• ONE YEAR IMMEDIATE REPLACEMENT WARRANTY

- **Speed: 120 or 160 characters per second**
- **Friction Feed/Tractor Feed — Standard**
- **80 character print line at 10 CPI**
- **1 Line Buffer, 2K Buffer on 120/160 CPS Plus LQM**
- **Six pitches**
- **Graphics capability**
- **Centronics compatible parallel interface**
- **Features Bidirectional Print, Shortline Seek, Vertical And Horizontal Tabs**

SUPER GRAPHICS

This is a sample of our near-letter-quality print. **emphasized** *italic print.* There is standard data processing quality print

Check these features & prices

120 CPS 10" Printer

List $429.00 **SALE $159**

120 CPS + Letter Quality Mode 10" Printer

List $449.00 **SALE $179**

160 CPS + Letter Quality Mode 10" Printer

List $499.00 **SALE $199**

SPECIFICATIONS

(IBM — Commodore)

Size/Weight
Height 5.04" Width 16.7"
Depth 13.4" Weight 18.7 lbs.
Internal Char. Coding
ASCII Plus ISO
Print Buffer Size
120 CPS: 132 Bytes (1 line)
120/160 CPS Plus LQM: 2K
No. of Char. in Char. Set
96 ASCII Plus International
Graphics Capability
Standard 60, 72, 120 DPI
Horizontal 72 DPI Vertical
Pitch
10, 12, 16.7, 5, 6, 8.3, Proportional Spacing
Printing Method
Impact Dot Matrix

Char. Matrix Size
9H x 9V (Standard) to 10H x 9V (Emphasized & Elongate)
Printing Features
Bi-directional, Short line seeking, Vertical Tabs, Horizontal Tabs
Forms Type
Fanfold, Cut Sheet, Roll (optional)
Max Paper Width
11"
Feeding Method
Friction Feed Std.; Tractor Feed Std.
Ribbon
Cassette — Fabric inked ribbon
Ribbon Life
4 million characters

(Apple — Atari — Etc.)

Interfaces
Parallel 8 bit Centronics compatible
120/160 CPS Plus NLQ: RS232 Serial inc.
Character Mode
10 x 8 Emphasized; 9 x 8 Standard; 10 x 8 Elongated; 9 x 8 Super/Sub Script (1 pass)
Character Set
96 ASCII
11 x 7 International Char.
Line Spacing
6/8/12/72/144 LPI
Character Spacing
10 cpi normal; 5 cpi elongated normal; 12 cpi compressed; 6 cpi elongated compressed; 16.7 cpi condensed; 8.3 cpi elongated condensed; 5.12.5 cpi elongated proportional

Cartridge Ribbon — List $19.95. **Sale $12.95.**

Interfaces

IBM $89.00 **Apple $59.00** **Atari $59.00** **Commodore $39.00**

Add $14.50 for shipping, handling and insurance. Illinois residents please add 6% tax. Add $29.00 for CANADA, PUERTO RICO, HAWAII, ALASKA. APO-FPO orders. Canadian orders must be in U.S. dollars.

WE DO NOT EXPORT TO OTHER COUNTRIES, EXCEPT CANADA.

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days delivery. 2 to 7 days for phone orders. 1 day express mail!

VISA — MASTERCARD — C.O.D. No C.O.D. to Canada or APO-FPO

PROTECTO

We Love Our Customers

22292 N. Pepper Rd., Barrington, Illinois 60010

312/382-5244 to order

Fighter Command

The date is August 13, 1940, a day referred to in the intercepted German messages as *Adlertag*, or Eagle Day. German forces occupy France. The RAF is still recovering from several weeks of air battles over Dunkirk as British land and sea forces withdrew from the advancing German forces. Intelligence reports indicate that the Luftwaffe is preparing a major air offensive against English targets. To win the Battle of Britain, the Luftwaffe must gain control of the air over the English Channel and Southern England. As long as England controls the sky, an invasion by sea would be extremely difficult. British naval forces still maintain supremacy on the seas, and air support from nearby RAF bases could turn back any assault. It's up to the RAF Fighter Command, under your direction, to stop the anticipated waves of German bombers and prevent an invasion.

Although many strategy war games are quite difficult, and SSI does rate *Fighter Command* as an intermediate level game, beginning war gamers will enjoy this historic defense of Britain. Choose one of the five levels of difficulty to suit your skill, from beginner to the full historic simulation for advanced players. You may choose to assume the role of commander of the RAF Fighter Command, and plan your strategy to win the Battle of Britain, while your computer controls the German Luftwaffe, or you and a friend may match wits, as one of you commands the RAF, while the other directs the Luftwaffe offensive.

Fighter Command allows you to direct the RAF through several scenerios in the Battle of Britain. I recommend that you try the Eagle Day Scenerio until you gain experience in directing your defense. Eagle Day covers only the first day of the battle and takes about an hour to play. When you've gained experience and confidence, direct the air defense of Britain through any of five scenerios, including the entire campaign for air supremacy over Britain.

You'll find the colorful maps included with the package very useful as the pace of the game increases. Follow your progress and plan your daily activities from the daily Intelligence reports, then issue orders to the squadrons under your command. For added realism, you'll occasionally be informed of probable targets of Luftwaffe bombers for that day's raids. This simulates the decoding of intercepted enemy communications. Your fighter squadrons will suffer losses, and morale will increase or decrease as the tides of the battle flow. You must rotate the front line squadrons efficiently to maintain a high degree of effectiveness against the seemingly endless stream of Luftwaffe bombers attacking across the channel and out of the North Sea. But rotation of too many of your key squadrons could weaken your defense in a critical area.

Don't plan on spending just one evening with the longer scenerios, which cover several days of battle. However, you may save your progress in the game before and after each day's activity. The entire campaign took me almost two weeks to complete, but without distraction, the campaign could be completed in a weekend. Each day's action can take up to an hour.

After a campaign is completed, the day-to-day attrition rates are displayed, and you can see where your strategy might have best been revised. This helps as you begin to plan your next defense.

One option I would have liked is a printout of the daily status reports. In all fairness, however, it should be noted that most games in this genre don't include this option. Also, it would be interesting to control the Luftwaffe and direct raids on British targets, while the computer controlled the defense. In the player versus computer mode, the computer controls the Luftwaffe.

If computer war gaming is one of your interests, *Fighter Command* is a must for your collection.

—George Miller

SSI
883 Stierlin Road
Building A-200
Mountain View, CA 94043
$59.95

Spellbreaker

You are the enchanter. You are the wizard.

You've grown from apprentice to master sorcerer to the leader of the Circle of Enchanters. After years of study, discipline, and hard work, you're at the peak of your magical powers. And now, all around you, the magic is failing.

This is *Spellbreaker*, the final installment in Infocom's *Enchanter* fantasy trilogy. For those who've struggled happily through the first two programs, *Enchanter* and *Sorcerer*, *Spellbreaker* is a fitting climax. It's an expert-level game for the Commodore 64, tougher than both previous adventures. Those new to Infocom's brand of interactive fiction would be well advised to start elsewhere—perhaps with the original *Enchanter*, a standard-level fantasy game—then work their way up to this. In the future, Infocom's designers will have to go a long way to create a more difficult and intriguing text adventure.

Spellbreaker opens with you standing amidst a congregation of Guildmasters in the Council Chamber of the Guild Hall at Borphee. All of the Guildmasters are looking to you to explain why the magic of the land has begun to fail. *Gloth* spells won't fold baker's dough for pastries anymore. *Fripple* spells fail to contain wild animals. And even the locally brewed beer, without benefit of magic, tastes more like cherry soda. But before you can begin to ask your questions, everyone in the crowd except you and a sinister cloaked figure is turned into a frog, toad, salamander, or newt. Good luck. You're on your own.

As with Infocom's other adventures, *Spellbreaker* uses a very sophisticated *parser*, the portion of the program that breaks down your English commands and questions into components that the game can process. You can communicate with the program in complete sentences, even stringing together more than one action as long as the command is no longer than two lines of text. The game's puzzles—the heart of the action—are complex, making previous experience in the *Enchanter* trilogy a definite plus.

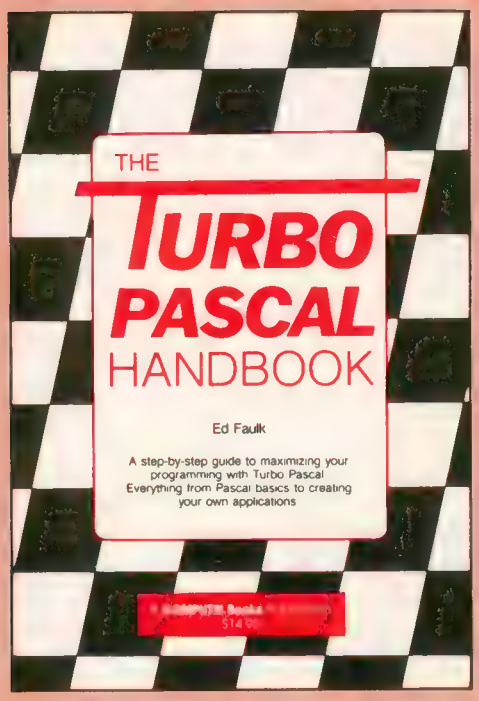
You're in possession of a magical spell book that's been a source of great power. Belboz the Necromancer gave it to you years ago in a previous adventure. But now, with the magic failing, many of the spells have faded from the pages. And those that remain you must relearn before using. Even the remaining spells frequently short circuit: Instead of writing a magic spell, your fingers simply grow numb; smoke clouds mushroom as another spell fizzles in the air.

There are other items of importance as well. Extremely rare spell scrolls dot the kingdom, giving you the power to use new spells or add them to your spell book for continued use. A magic burin lets you inscribe objects with words or runes that have magical power. And of course there are the spells themselves: *lesoch*, to generate a gust of wind; *jindak*, to detect magic; *yomin*, to probe someone's mind; and a variety of other incantations, some useful and some not. Learning how and when to cast spells is one of the keys to proceeding through the kingdom to find out who's stealing the magic.

Spellbreaker is the work of Dave Lebling, co-author of the popular ZORK series of adventures and of *Enchanter*. He also created the *Starcross* and *Suspect* Infocom adventures. With *Spellbreaker*, Lebling has written his

Explore Pascal with

THE TURBO PASCAL HANDBOOK from COMPUTE!.



The Turbo Pascal Handbook

Edward P. Faulk

With *The Turbo Pascal Handbook* and *Turbo Pascal* from Borland International, you'll be gently guided, step-by-step, until you're creating your own powerful applications in this impressive computer language.

$14.95 ISBN 0-87455-037-8

This information-packed book from COMPUTE! is an outstanding resource and programming guide. And it's written in COMPUTE!'s bestselling style so that even beginning programmers can quickly and easily understand all the applications.

Ask for *The Turbo Pascal Handbook* at your local computer store or bookstore. Or order directly from COMPUTE!. Call toll free 1-800-346-6767 (in NY 212-887-8525) or mail the attached coupon with your payment (plus $2.00 shipping and handling per book) to COMPUTE! Books, P.O. Box 5038, F.D.R. Station, New York, NY 10150.

Note: You'll need *Turbo Pascal* in order to use this book. The software is not included with *The Turbo Pascal Handbook.*

Yes! Send me _____ copies of *The Turbo Pascal Handbook* at $14.95 each.
My payment is enclosed.

ALL ORDERS MUST BE PREPAID IN U.S. FUNDS

Subtotal _____
NC residents add 4.5% sales tax _____
Shipping and handling _____
($2.00 per book in U.S. and surface mail; $5.00 per book airmail.)
Total enclosed _____

☐ Payment enclosed (check or money order)
☐ Charge ☐ Visa ☐ MasterCard ☐ American Express

Account No. _____ Exp. Date _____
(Required)

Name _____

Address _____

City _____ State _____ Zip _____

Please allow 4–6 weeks for delivery.

36303711

COMPUTE!™ Publications, Inc. abc

One of the ABC Publishing Companies
825 7th Avenue, 6th Floor, New York, NY 10019
Publishers of COMPUTE!, COMPUTE!'s Gazette, COMPUTE!'s Gazette Disk, COMPUTE! Books, and COMPUTE!'s Apple Applications

Lyco Computer Marketing & Consultants

ATARI

ATARI

800XL ..... CALL
130XE (NEW) ..... CALL
520ST (NEW) ..... CALL
1050 Drive 165
1010 Recorder 42
1020 Printer 55
1025 Printer 159
1027 Printer 179
850 Interface 109

ATARI

VIP Professional 74.50
ST Companion 15.95

ATARI SOFTWARE (NEW)

Codewriter 35.75
Filewriter 20.75
Reportwriter 20.75
Menuwriter 20.75
Home Integrator 19.75
Small Bus Inventory 11.75
Salesman Expenses 11.75
Accs Rec/Pay 11.75
Retail Invoice 11.75
Final Legacy 15.75
Adventure Writer 18.75
Star Voyager 11.75

BRODERBUND (Atari)

The Print Shop 28.95
Graphics Library 18.95
Graphics Library II 19.50
Bank St. Writer 42.75
Whistler's Brother 18.95
Spelunker 18.95
Stealth 18.95
Serpent's Star 24.95
Mask of the Sun 24.95

INFOCOM (520ST)

Wishbringer 28.95
Zork I 28.95
Zork II 31.95
Zork III 31.95
Deadline 33.95
Starcross 33.95
Suspect 31.95
Suspended 33.95
Cutthroats 28.95
Sea Stalker 28.95
Infidel 31.95
Sorcerer 31.95
Enchanter 28.95
Witness 28.95
Planetfall 28.95
SpellBreaker 33.95

SPINNAKER

Delta Drawing Room 19.95
Cosmic Life Room 19.95
Up for Grabs Room 19.95

PERSONAL PERIPHERALS

Super Sketch C-64 ..... 29.95
Printer Utility C-64 ..... 14.99
Super Sketch Atari 25.95
Super Sketch Apple/Ibm 55.00

MICROPROSE (Atari)

Kennedy Approach 21.75
Crusade in Europe 24.75
Decision in Desert 24.75
Solo Flight 20.75
Nato Commander 20.75
Spitfire Ace 18.75
F-15 Strike Eagle 20.75
Hellcat Ace 18.75
Acrojet 21.75
Silent Service 21.75
Gunship 21.75

SSI (Atari)

Colonial Conquest 24.75
Field of Fire 24.75
Kampfgruppe 36.75
Objective: Kursk 24.75
Market Garden 29.75
Six Gun Shootout 24.75
War in Russia 49.75
Computer Baseball 24.75
Computer Quarterback 24.75
Gemstone Warrior 22.75
50 Mission Crush 24.75
Questron 29.75

HABA

10 Megabyte ..... CALL
Hippo C Compiler 49.95
Check Minder 49.95
Business Letters 36.95
Wills 36.95

SOFTECHNICS

Timelink 75.00
Rhythm 39.95

MIRAGE CONCEPTS

EXPRESS 34.95

SUB LOGIC (Atari)

Flight Simulator II....32.75
Night Mission Pinball 20.75

apple

SCARBOROUGH (Apple)

NET WORTH 48.75
Improved Mastertype 22.75
Mastertype Filer 22.75

BRODERBUND (Apple)

The Print Shop 31.50
Graphics Library 18.50
Graphics Library II 18.95
Paper Refill 11.95
Bank St Writer 64K 41.50
Bank St Writer 128K 42.75
Bank St Filer 42.75
Bank St Mailer 42.75
Bank St Speller 42.75
Carmen Sandiego 22.75
Karateka 22.75
Captain Goodnight 22.75
Muppey Cruise 25.75

SUB LOGIC (Apple)

Flight Simulator II....32.75
Night Mission Pinball 20.75

MICROPROSE (Apple)

Crusade in Europe 25.75
Decision in Desert 25.75
F-15 Strike Eagle 21.75
Nato Commander 21.75
AcroJet 21.75
Silent Service 21.75
Gunship 21.75

SSI (Apple)

Mech Brigade 36.75
Norway 1985 ..... 22.75
Market Garden 29.75
Six Gun Shootout 24.75
50 Mission Crush 24.75
Phantasie 24.75

INNOVATIVE CONCEPTS

Flip-n-File 10 ..... 3.50
Flip-n-File 15 ..... 8.25

COMMODORE

COMMODORE

C-128 NEW ..... CALL
1571 Drive ..... CALL
1572 Drive ..... CALL
1902 Monitor ..... CALL
1670 Modem ..... CALL
C-64 Computer ..... CALL
1541 Drive 189
MPS801 Printer ..... LOW
1702 Monitor 199
Simon's Basic 24.75
Assembler 64 ..... 34.75
Super Expander 22.75
Logo 64 ..... 49.75
Pilot 64 ..... 38.75
Easy Cale 34.75
Easy Script 38.75

CARDCO

Digitizer Camera 189.95
32K Printer Buffer 59.95
Numeric Keypad 34.95
CB/5 5-slot Board(64) 54.00
CB/2 2-slot Board(64) 25.00
S'More Basic Rom 49.95
Write Now-64 ..... 35.00
Mail Now-64 ..... 29.00
Spell Now-64 ..... 29.00
File Now-64 ..... 29.00
Paint Now-64 ..... 29.00
Calc Now-64 ..... 29.00
Tax Survival 29.00
Super Printer Utility 27.95
Write Now-Vic-20 ..... 29.95

SPINNAKER (C-64ROM)

Cosmic Life ROM 19.75
Jukebox 19.75
Alphabet Zoo 17.75
Alf in Color Caves 19.75
Up for Grabs 19.75
Delta Drawing 19.75
Kids on Keys 16.75
Kindercomp 14.75
Facemaker 17.75
Fraction Fever 17.75

MICROPROSE (C-64)

Kennedy Approach 21.75
Crusade in Europe 24.75
Decision in Desert 24.75
Solo Flight 20.75
Nato Commander 20.75
Spitfire Ace 18.75
F-15 Strike Eagle 20.75
Hellcat Ace 18.75
Acrojet 21.75
Silent Service 21.75

SSI (C-64)

Colonial Conquest 24.75
Wings of War 24.75
Computer Ambush 34.75
Field of Fire 24.75
Fighter Command 36.75
Kampfgruppe 36.75
Mech Brigade 36.75
Market Garden 29.75
Six Gun Shootout 24.75
Computer Baseball 24.75
Computer Quarterback 24.75
Imperium Galactum 24.75
Phantasie 24.75
Cartels & Cutthroats 24.75
50 Mission Crush 24.75
Questron 24.75

BATTERIES INCLUDED

Paper Clip 59.95
Spell Pak 34.95
Consultant 59.95
Paper Clip w/Spell Pak 75.95
Home Pak 34.95
Bus Card 129.95
80 Column Board 109.95

BRODERBUND

The Print Shop 28.75
Graphics Library 18.75
Graphics Library II 19.75
Graphics Library III 19.95
Karateka 19.75
Castles Dr. Creep 19.75
Bank St. Writer 32.75
Loderunner 20.75
Mask of the Sun 24.75
Spelunker 19.75
Serpent's Star 24.75
Whistler's Brother 18.75
aid Bungeling Bay 18.75

SUB LOGIC (C-64)

Flight Simulator II....32.75
Night Mission Pinball 20.75

COMMODORE

MPS1000 Printer 259
C1350 Mouse 42
C1700 128K RAM 145
C1750 512K RAM 269
JANE 35
Perfect Writer 49
Perfect Calc 49
Perfect Filer 49

US ROBOTICS

Password 1200M 229
Password 1200F 229
Password 300M 139
Password 300F 139
Autodial 212A 359
PCM5 319
PCM64 519
PCM256 769
S-100 379
Courier 469
Microlink 469
Telpac Ms-DOS 79

RACAL-VADIC

2400PC 549
2400PA 799
2400V 559
1200PC 329
300V 205
300PC 199

HAYES

SMARTMODEM 300 133
SMARTMODEM 1200 377
SMARTMODEM 1200B 347
SMARTMODEM 2400 598
MICROMODEM IIE 135

ANCHOR

Volksmodem 55
Volksmodem 12 186
Mark 12 229

TELE LEARNING

Total Telecommunications (C-64) 29.95
AP-250 (300 Baud Apple) 69.95
IB-250 (300 Baud IBM) 69.95

NOVATION

IBM 300/1200 MS-DOS ext 319
IBM 300/1200 CPM-86 ext 319
IBM 300/1200/2400 ext 529
IBM 300/1200/2400 MS-DOS 579
IBM MS-DOS int 325
IBM CPM-86 int 325
Macmodem 300/1200 315

MICROBITS

1064 Modem 57

MONITORS

TAXAN

115 12" Greeen Composite ..... CALL
116 12" Amber Composite ..... CALL
121 12" Green TTL 135
122 12" Amber TTL 145
220 14" Color Composite 259
410 12" RGB Hi Res IBM 329
420 12" RGB Super Hi IBM 409
440 12" RGB Ultra Hi Res 555
Tilt Stand 35

PRINCETON GRAPHICS

MAX-12 Amber 185
HX-12 RGB 465
SR-12 RGB 595

PANASONIC

DT1300D 13" RGB/Composite 247
DTM140 14" RGB/Composite 329
DTH103 10" RGB Hi Res 395
DTS101 10" Composite 175
DT1000G 10" RGB 166
TX12H3P 12" Color 419
TR120M1PA 12" Green 109
TR120M8PA 12" Amber 109
TR122M9P 12" Green IBM 148
TR122MYP 12" Amber IBM 148

X-TRON

Comcolor I Composite Green 177

SAKATA

SG 1000 12" Green 99
SA 1000 12" Amber 109
SG 1500 12" Green TTL 119
SA 1500 12" Amber TTL 129
SC 100 13" Color Comp 209
SC 200 13" RGB 389
STS1 Tilt Stand 29

ZENITH

ZVM 122A Amber 75
ZVM 123G Green 75
ZVM 124 Amber IBM 129
ZVM 131 Color 275
ZVM 133 RGB 389
ZVM 135 Composite 449
ZVM 136 Hi Res Color 589
ZVM 1220 95
ZVM 1230 95
ZVM 1240 149

TEKNIKA

MJ-10 Composite 179
MJ-22 RGB 255

AMDEK

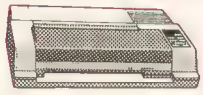
300 Green 118
300 Amber 128
310 Amber IBM 155
Color 300 Audio 234
Color 500 Composite 369
Color 600 397
Color 700 495
Color 710 569

NEC

JB-1260 Green 95
JB-1201 Green 135
JC 1215 Color 235
JC 1216 RGB 375
JC 1460 Color 265

LYCO COMPUTER
AMERICA'S MAIL ORDER HEADQUARTERS!

Lyco Computer Marketing & Consultants



1091.....$233

SAVE ON THESE IN STOCK PRINTERS

AXIOM SEIKOSHA

GP-50AT (Atari)	222
GP550CD (C-64)	222
GP700AT (Atari)	439
GP700AP (Apple)	439
ELITE5CD (C-64)	229

C. ITOH

ProWriter 8510Sp+	349
1550Sp+	489
StarWriter	769
PrintMaster	929

TOSHIBA

P1340	469
P351+	1149
P341P	969
P341S	999
351 Sheet Feeder	529

CARDCO

32K BUFFER..(C-64)	59

CORONA

LP300 Laser Printer	2686
200361 Toner Cartridge	89

EPSON

FX85 (New)	333
LX80	212
FX185 (New)	464
LX90 (New)	226
SQ2000 (New)	1555
JX80	467
Homewriter 10	193
CR-20-Atari	153
CR-220-C-64	153
DX-10 (New)	207
DX-20 (New)	297
HS-80 (New)	288
LQ1500P	975
LQ1500S	1039
RX-100	356
FX-100+	CALL

CITIZEN

MSP-10	269
MSP-15	358
MSP-20	337
MSP-25	495
Sheetfdr (10/20)	189
Sheetfdr (15/25)	199

OKIDATA

Okimate 10	179
Okimate 20	CALL
182	214
192	348
193	563
92P	349
93P	565
84P	645
92 Imagewriter	349

*IBM versions also

BROTHER

HR-15XL-P	359
HR-15XL-S	359
HR-35P	839
HR-35S	839
2024L-P	949
M1009-P	189

JUKI

Juki 6100	347
RS232 Serial Board	55
6100 Tractor	119
6100 Sheet Feeder	209
Juki 6300	757

LEGEND

880	188
1080	222
1380	262
1385	296
LEGEND 808	159

DIGITAL DEVICES

16K BUFFER	75
32K BUFFER	89
64K BUFFER	125

DIABLO

D25	549
630 API	1599
630 ECS	1759
D 80 1F	2395
P 32 CQ1	699
P 38	1749
C 150	999
DX-35 (NEW)	CALL
AP-80	CALL

SG-10.....$208

PANASONIC

1091	233
3131 (NEW)	269
1092	373
1093	426
3151 Letter	426
4K Buffer	65

SILVER REED

EXP400	249
EXP500	295
EXP550	399
EXP770	749

STAR MICRONICS

SG-10	208
SG-15	373
SD-10	336
SD-15	442
SR-10	483
SR-15	583
SB 10	595
Power Type	303
SG-10 C-64 (NEW)	CALL

DUST COVERS

Atari

520ST	11.95
130XE	6.99
800XL	6.99
1050	6.99
1025	7.99

Commodore

C128	7.99
1571/1541	6.99
1902	10.95
1702	8.99
C64/Vic20	6.99

Panasonic

1090/1091	8.99
1092	8.99
1093	9.99

Star Micronics

SG/SD10	8.99
SG/SD15	9.99
SR10	9.99
SR15	9.99

Okidata

82/92	8.99
83/93	9.99
193	9.99

DRIVES

INDUS

GT ATARI	215
GT COMMODORE	235

COMTEL

Enhancer 2000 (c-64)	179

TANDON

*320K 5¼" Drive	115

TYMAC

MDD-640 3½" Apple Drive 640K	289

MSD

SD1 Drive (C-64)	229
SD2 Drive (C-64)	469

PRINTER INTERFACING

AXIOM

AT846 (Atari)	65
Parallax (C-64)	65

MICROBITS

MPP-1150 (Atari)	54
MPP-1150XL (Atari)	59
MicroPrint (Atari)	39
64K RAM Board (600xl)	65

DIGITAL DEVICES

ApeFace XLP (Atari)	49
ApeFace 12XLP (1200xl)	49
U-Print A (Atari)	54
U-Print C (C-64)	49
U-Print A16K Buffer	74
U-Print A64K Buffer	99
U-Print AP16K (Apple)	99
U-Print AP64K (Apple)	139
U-CALL RS232 (Atari)	37

MICROTEK

Dumpling GX (Apple)	59
Dumpling 16K (Apple)	89
RV-611C (Apple)	49

TYMAC

Connection (C-64)	55
Tackler (Apple)	49
PPC-100 (Apple)	39

ORANGE MICRO

GRAPPLER+ (Apple)	85
Grappler 16K (Apple)	149
ORANGE (Apple)	59
Grappler CD (C-64)	79

CARDCO

G-Wiz (C-64)	54
C/?+G (C-64)	45
C/?PS (C-64)	49
C/?B..(C-64)	39
C/?AT (Atari)	49
C/?AP (Apple)	49

DISKETTES

DENNISON

ELEPHANT 5¼" SSSD	11.99
ELEPHANT 5¼" SSDD	12.99
ELEPHANT 5¼" DSDD	14.99
PREMIUM 5¼" SSDD	13.99
PREMIUM 5¼" DSDD	15.99

SUNKYONG

SKC 5¼" SSDD	11.99
SKC 5¼" DSDD	13.99

MAXELL

5¼" MD1	13.99
5¼" MD2	19.99

VERBATIM

5¼" SSDD	13.99
5¼" DSDD	19.99

BONUS

5¼" SSDD	9.99
5¼" DSDD	12.99

NO LABEL DISKETTES

NL 5¼" SSDD...10.99 (Box 10)
NL 5¼" DSDD...15.99 (Box 10)
*Free Diskette Writer Pen!
*Free Storage Case!

IBM-PC SOFT-WARE

*LOTUS

Lotus 1-2-3	309.00
Symphony	439.00

*QUADRAM

Quad Jr. Exp. Chassis	519.00
Quad Jr. Exp. Memory	209.00
Quad Memory Jr.	209.00

ITT XTRA XP Personal Computer!
*256K, 2 Drive System.....CALL
*256K, 10 Meg. Hard System..Call

IBM-PC COMPATABLE

*LEADING EDGE

Nutshell	69.95
LEWP Basic	65.00
LEWP Merge Print	99.00
LE Spell Correction	169.00

SSI (IBM)

Battle for Normandy	24.95
Knights of Desert	24.95
Tigers in Snow	24.95
Computer Baseball	24.95
Epidemic	22.95
Warp Factor	24.95
Cartels & Cutthroats	24.95

SYNAPSE (IBM)

Synstock	64.95
Essex	28.95
Wizard of Wall St	28.95
Brimstone	28.95

SUB LOGIC (IBM)

Jet Simulator	34.95

BRODERBUND (IBM)

Bank St Writer	48.95
The Print Shop	34.95
Graphics Library I	22.95
Lode Runner	22.95
Ancient Art of War	27.95
Champ Lode Runner	22.95

MICROPROSE (IBM)

F-15 Strike Eagle	20.75
Solo Flight	20.75
Hellcat Ace	20.75
Spitfire Ace	18.75

AT&T

Safari 7300	CALL
6300	CALL

TOLL FREE 1-800-233-8760

TO ORDER

CALL TOLL FREE
800-233-8760
Customer Service 1-717-327-1825

or send order to
Lyco Computer
P.O. Box 5088
Jersey Shore, PA
17740

RISK FREE POLICY

In-stock items shipped within 24 hours of order. No deposit on C.O.D. orders. Free shipping on prepaid cash orders within the continental U.S. Volume discounts available. PA residents add sales tax. APO. FPO. and international orders add $5.00 plus 3% for priority mail service. Advertised prices show 4% discount for cash; add 4% for MasterCard or Visa. Personal checks require 4 weeks' clearance before shipping. Ask about UPS Blue and Red label shipping. All merchandise carried under manufacturer's warranty. Free catalog with order. All items subject to change without notice.

most complex and mature work of interactive fiction. In today's computer adventure, lands of enchantment are a dime a dozen; but Lebling has created a more forbidding landscape of intrigue—a kingdom whose very foundations are suddenly suspect. The staff of magic is full of worm holes, and to lean on it too heavily is to risk its collapse.

With *Spellbreaker,* Infocom has extended its reputation for literate, engaging, often perplexing, and always challenging interactive fiction. Even the packaging, with its slick "Frobozz Magic: Magic Equipment Catalog" (a subsidiary of Frobozzco International) is first-rate. Now, the legions of Infocom fans will once again have to set aside careers, families, friendships, and hobbies until the kingdom is safe.

—Selby Bateman

Infocom, Inc.
125 Cambridge Park Dr.
Cambridge, MA 02140
$44.95

Touchdown Football

More than a year ago, Imagic released an action-strategy sports game for the Commodore 64 called *Touchdown Football.* Unfortunately, the game—which happens to be very good—did not get a great deal of national distribution. Now, Electronic Arts, through its affiliated distribution label, is making the game available once again.

What makes *Touchdown Football* well worth recommending is its mixture of play elements. The graphics are colorful and crisp; sound effects, such as crowd noise and music, are good; game play is handled easily with a joystick; and there are enough options to make the game a real contest whether you're playing against the computer or another player. In short, the action is fast and fun.

There are six players to a side, with a total of nine offensive formations (strong left and right, slot left and right, I-left and right, split, shotgun, and kick) and nine defensive formations (monster left and right, tight left and right, prevent left and right, blitz, zone, and goal line). The two receivers have nine patterns, including buttonhook, streak, flag post left and right, side line left and right, safety valve left and right, and block/no pass. There are also different kicking offensive and defensive options, and the linemen can block left, right, and straight.

The simulation includes timeouts, a real-time clock, penalties, and blocked kicks. It's even possible to call an "audible" from the line of scrimmage. With the joystick, you control one player at a time, while the computer handles the other five men on your team. The program dynamics here make computer control a complement to the game rather than a hindrance. For example, when you pass the ball, as quarterback, control passes automatically to your receivers after the ball is released.

Touchdown Football doesn't weigh you down with too much strategy, although there are hundreds of play options. They're quickly and easily accessible, even for younger players. The emphasis is on action, and in that you'll find *Touchdown Football* a game you'll enjoy.

—Selby Bateman

Imagic
Dist. by Electronic Arts
2755 Campus Dr.
San Mateo, CA 94403
$29.95

COMPUTE!'s Gazette is looking for utilities, games, applications educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it, on tape or disk to:

Submissions Reviewer
COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403

Please enclose an SASE if you wish to have the materials returned. Articles are reviewed within four weeks of submission.

BACKUP PROTECTED SOFTWARE *FAST* with COPY II 64/128™

From the team who brought you *COPY II PLUS* (Apple), *COPY II PC* (IBM) and *COPY II MAC* (Macintosh) comes a revolutionary new copy program for the Commodore 64 and 128 computers.

- Copies most* protected software — *automatically.*
- Copies even protected disks in just 2 minutes (single drive).
- Copies even protected disks in just 1 minute (dual drive).
- Maximum of four disk swaps on a single drive.
- Includes fast loader, 12 second format.

Requires a Commodore 64 or 128 computer with one or two 1541 or 1571 drives.

CENTRAL POINT Software, Inc.
9700 SW Capitol Hwy., #100
Portland, OR 97219

503/244-5782
M-F, 8-5:30, W. Coast Time
CHECK, COD WELCOME
(Prepayment Required)

$39.95
plus $3 s/h ($8 overseas)

*We update Copy II 64 regularly to handle new protections; you as a registered owner may update at any time at a reduced price.

This product is provided for the purpose of enabling you to make archival copies only

VISA MasterCard

- YOUR ORDER ON IN STOCK ITEMS IS SHIPPED UPS GROUND NEXT BUSINESS DAY — 2ND DAY AND NEXT DAY AIR AVAILABLE
- OPEN 9-8 MON-FRI; 10-5 SAT. EAST COAST TIME
- IF BY SOME OVERSIGHT WE DON'T HAVE THE LOWEST PRICE... GIVE US A CHANCE TO BEAT IT

ORDERS ONLY ... CALL TOLL FREE

LOW PRICES + FAST DELIVERY = 1-800-468-9044

INFORMATION & PA ORDERS 814-234-2236

★ EPSON ★ STAR ★ JUKI ★ LEGEND ★ COMMODORE ★

LX-80 ..... $214.95
LX-80 tractorfeed ..... $ 34 95
Homewriter 10 .... $246.95
includes Commodore or Atari interface
EPSON
FX-85 .... $314.95
FX-185 ... $444.00
HS80 ..... $299.00

PRINTER INTERFACES

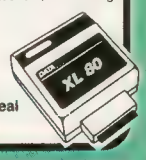
Cardco Super G . $CALL
Cardco G Wiz ... $CALL
Tymac Connection $67.95
MW-350 ..... $CALL
MW-350 w/buffer . $CALL
Grapler CD $87.95

DATA 20 XL-80

The XL-80 is an 80 column board that plugs into the back of your C-64. It's **compatible with the Mitey Mo** modem software to give you an 80 column terminal on your C-64. Included with the XL-80 is an 80 column word processor, spreadsheet, and mailing list program.

XL-80
$79.95

XL-80 & MITEY MO Package Deal
$127.95



LEGEND PRINTERS

808 ..... $159
880 ..... $CALL
1080 ..... $219
1380 ..... $259
1385 ..... $295

JUKI

PRINTER/TYPEWRITER
2200 ..... $264

PRINTERS
5510P $329
600P $169
6100P $344
6100S $389

Xetec Inc.

SUPER GRAPHIX interface w/8K buffer, down loadable fonts ..... $ lowest price

SUPERGRAPHIX jr printer interface.. $46.95

FONT MASTER.. $24.95

PANASONIC

1091 .. $229.00
1092 ..... $309.00
1093 ..... $CALL

LETTER QUALITY PRINTERS when near letter quality isn't good enough

Cardco LQI $199
Epson DX-10 ..... $209
Epson DX-20 ..... $309
Star Powertype $299

MIRAGE CONCEPTS

Database Manager with Report Generator $36.99
Prof. Wordprocessor... $36.99
Database Manager, Prof. WP Package..... $67.95

The Print Shop

Broderbund Print Shop ... $25.95
Graphics Library I or II... $16.95
120 sheet color paper refill
½ red, ½ blue, ½ gold $8.95

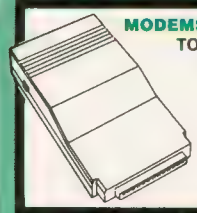
ENHANCER 2000 DISK DRIVE

$159
ONE YEAR WARRANTY

PRO-LINE SOFTWARE

GT 4, fast load/fast save disk basic/cartridge for C-64.. $29.95

C POWER
C COMPILER $69.99
CADPIC $36.95
CASHBOX $36.95
Wordpro 64 ..... $36.95
Spellpro 64 ..... $32.95
Mailpro 64 ..... $24.95
Profile 64 ..... $36.95
PAL 64 ..... $32.95
POWER 64 ..... $32.95
TOOLBOX 64 ..... $69.95



MODEMS — MODEMS — MODEMS

TOTAL TELEMODEM ... $29.95
MASTER MODEM ... $39.95
includes Compuserve, Dow Jones time
VOLKS 6470 1200/300 baud $159.00
1660 ..... $CALL
WESTRIDGE AUTO $59.95
MITEY MO. $59.95
VIP TERMINAL $29.95
VIDTEX TERMINAL $23.95
COMPUSERVE STARTER KIT $19.95

MONTHLY SPECIALS UNTIL March 31, 86

Epyx Multiplan 128 ..... $37.95
Enhancer 2000 ..... $159.00
Volks 6470 Modem $159.00
Newsroom ..... $CALL

TUSSEY BRAND DISKETTES

We've introduced our own brand of diskettes, and guaranteed them for life!!! Included is tyvek sleeve, hub ring, and write protect tags.

	Qty. 10	Qty. 20	Qty. 50
TUSSEY BRAND SS DD	99	.97	89
TUSSEY BRAND DS/DD	1.14	1.11	1.05
MAXELL SS/DD	1.29	1.25	1.19
MAXELL DS/DD	1.49	1.44	1.39
NASHUA SS/DD	.99	95	89
NASHUA DS/DD	1.19	1.15	1.09
BONUS SS/DD	99	95	89
BONUS DS/DD	1.19	1.15	1.09
CENTECH COLORED SS DD (SAME AS BONUS)			
CENTECH COLORED DS DD (SAME AS BONUS)			

Prices are per disc

Cardco LQI BLOWOUT

$199
LIMITED QTYS
Daisywheel Printer with Centronics and Commodore Interface

cardco, inc.

COMMODORE 128= HARDWARE

C128
1571, 1572 DRIVES
1902 MONITOR
MPS 1000 PRINTER
1350 MOUSE
1700, 1750 RAM EXPANSION

CALL NOW FOR LOWEST PRICES

SAVE A BUNDLE ON A BUNDLE

PACKAGE DEALS AVAILABLE
CALL FOR DETAILS

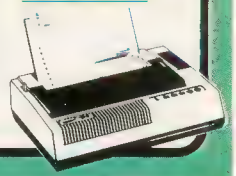
Call for Price on C64
1541...$CALL, 1802...$CALL, MPS-801...$106.95

COMMODORE 128= SOFTWARE

JANE $32.95
WORDPRO 128 ..... $CALL
Perfect Calc $42.95
Perfect Writer ..... $CALL
Perfect Filer ..... $CALL
Vizastar 128 ..... $CALL
Vizawrite ..... $CALL
Swiftcalc 128 w/sideways $54.95
Wordwriter 128 ..... $CALL
CMS 128 Acct. ..... $CALL
Multiplan 128 ..... $37.95
Basic Program Toolkit From Epyx ..... $CALL
Consultant 128 ... $39.95
Paperclip 128 .... $39.95
P-clip 128 w/ Spellpack ..... $CALL

SG-10 ..... $CALL
SG-10C $226
Commodore ready
SG-15 ..... $364
SD-10 ..... $323
SD-15 ..... $449
POWERTYPE .. $299
18cps daisywheel
SR-10,
SR-15 ..... $CALL

star MICRONICS INC



PRINTER PACKAGE MANIA!

all packages work with C64 or C128

star SG-10 & XETEC SUPERGRAPHIX $274.95

SG-10 & Xetec Supergraphix jr $254.95
SG-10 & Cardco G-Wiz $259.95
SG-10 & MW-350 ..... $269.95
SG-15 & Xetec Supergraphix $419.95
SG-15 & Cardco G-Wiz $412.95
SD-10 & Xetec Supergraphix $384.95

PANASONIC

1091 & Xetec Supergraphix $289.95
1091 & Cardco G-Wiz $279.95
EPSON
LX-80 & Xetec Supergraphix $269.95
LX-80 & Cardco G-Wiz $264.95
FX-85 & Xetec Supergraphix $379.95
FX-185 & Xetec Supergraphix $509.95

- Purchase orders accepted from qualified corporations and educational institutions
- We accept Mastercard, Visa, COD, and Mail Orders
- No Sales Tax on Orders outside PA
- Buy with confidence. We honor manufacturer's warranty

TOP 10 GAMES

Hitchhikers $22.95
Microleague Baseball $27.95
Kareteka $19.95
Kung Fu (Spinnaker) ..... $CALL
F-15 Strike Eagle $21.95
Flight Simulator II $32.95
FSII Scenery (d) ..... $CALL
Hobbit ..... $CALL
Murder By The Dozen $24.95
Sargon III $37.95

INFOCOM

Hitchhikers Guide $22 95
Deadline $25.95
Enchanter $25 95
Infidel $29.95
Sorcerer $29.95
Witness $25.95

BLUE CHIP

Baron $24 95
Millionaire $24.95
Tycoon $24.95

WORD PROCESSORS

Wordpro 64 (d) $36.95
Fleet System II (d) ..... $CALL
Paperclip (d) $47.95
Paperclip w/Spellpack (d) $59.95
Cardco Write Now/64 (c) $37.00
OmniWriter/Speller (d) $39 95
Mirage Professional W P. (d) .. $36.95
Xetec Font Master (d) $24.95
Trio (d) ..... $CALL
Mirage Personal W.P. ..... $ 9.95

DATABASES

Consultant (d) $49 95
Mirage Database w/Rpt Gen (d) $36.95
Superbase 64 (d) $44.95
Practifile (d) $12.95

RGBI/Composite Monitors

Technica MJ-22 ..... $269 00
Panasonic 1300 ..... $CALL
RGBi Cable $19.95
Composite Video Cable ..... $ 6.95

MONITORS

SAKATA SC100
13" COLOR $149.00
Zenith 12" Amber 122 ..... $ 77.95
Zenith 12" Green 123 ..... $ 77.95
NEC 12" Green ..... $ 69.95
Cable for monitors ..... $ 6.95

SPREADSHEETS

Vizastar 64 ..... $79.95
Vizastar (d,c) $86 95
Practicalc (d) or (t) $12 95
Calkit $39.95
Programmable Spreadsheet .. $19.95
Calc Result Adv. (d,c) $67 00
EZ Calc $19.95
Cardco Calc Now/64 ..... $31.95
Calc Result Adv $67.00

BI HARDWARE

Bi-80 ..... $106 95
Buscard II ..... $CALL

CARDCO

Graph Now $29.95
Numeric Keypad $35.00
5 slot expansion CB/5 ..... $58.00
Mail Now 64 (d) $31.95
Spell Now (d) $31.95

UTILITIES

CSM 1541 Align (d) $29.95
Simon's Basic $29.95
Canada A/M (d) $39.95
Merlin 64 (d) $33.95

INTEGRATED SOFTWARE

Trio (d) ..... $CALL
Homepak (d) $39 99
Vizastar $79.95

MISCELLANEOUS

Koalapad w/Painter $59.95
Koala Printer (d) ..... $CALL
Kid Pro Quo (d) (d) $27 99
Softsync Personal Acct. (d) ... $32.95
FCM (d) $19.95
Cont. Home Acct. (d) $46.95
Complete Personal Acct. (d) .. $54.00
64 Doctor (d) $24.95
Timeworks Inventory, A/P, A/R, C/F, General Ledger, Payroll (d) .. $40.95 ea
PC Pal Printer Stand $19.95
1541 Express ..... $CALL
Fast Cable ..... $CALL
Epyx Fast Load $24.95
Broderbund Print Shop (d) $25.95
Graphics Library I (d) $16.95
Naverone 3-slot cartridge expander $27.95
Musicalc ..... $CALL

To order by mail: We accept money order, certified check, personal check, Allow 2 weeks for personal check to clear.
Shipping: $2.50 for software and accessories/$10.00 for printers and color monitors/$8.00 for disk drives and other monitors/Add $3.00 per box shipped COD. Call for other shipping charges. Additional shipping required on APO, FPO, AK, HI, and foreign orders.

Terms: ALL PRICES REFLECT CASH DISCOUNT, ADD 3% FOR MASTERCARD OR VISA. Manufacturer's warranty honored with copy of our invoice. **ALL SALES ARE FINAL.** Defective items replaced or repaired at our discretion. Pennsylvania residents add 6% sales tax. Prices and terms subject to change without notice.

tcp **TUSSEY COMPUTER PRODUCTS**

P.O. BOX 1006
STATE COLLEGE, PA 16804

SPECIALS

Disk notcher — $5.99
Double your disk capacity with this little tool

Generic Disks DS/DD — 79¢

FAST RAM

- Powerful all machine language program.
- Takes up only 4K of memory
- Adds 10 new commands plus and advanced DOS wedge

Store programs or sequential in Ram for almost instant access. This gives you the advantage of having several programs in memory at the same time
Imagine writing a game and having a sprite editor program in memory at the same time!

ONLY $19.95

MASTER LOCK

Here, at last, is a program that will protect your software programs from unauthorized duplicating. 1 to 1 million copies can be protected fast and easy

- Specially designed for the C-64 and 1541 Disk Drive
- Completely encrypts and protects your programs
- Fully compatible with almost all machine language and basic programs — can even support chained programs
- Contains a special feature which protects your program from being "broken"
- Incorporates all the latest techniques in program encryption and protection
- Each system has been specially prepared and is unique from all other systems — only **you** are able to make working duplicates of your own protected programs
- Simple and easy to use — entirely menu drive with prompts
- Will stop virtually all software copiers from duplicating your programs
- Fast and reliable protection routine does not take away any useable space from your disk — all 664 blocks are available for use
- Easy to follow step by step instructions are included on the disk
- A **must** for all programmers who do not want their programs to be in public domain!

Even the "nibblers" can't copy them. Not even "Disk Maker, "Mister Nibbles, "Copy II, "Ultra Byte or "Fast Hackem. The time to protect you disk is only 5 (five) seconds and each Master Lock makes a different protection scheme. Only

"Disk Maker™, Basix
"Mister Nibbles™, Full Circle
"Copy II™, Central Point Software
"Ultra Byte™ Ultra Byte
"Fast Hackem™, Basement Boys Software

$29.95

TOOLBOX 64 AND NEW TOOLBOX 128

Side 1 contains over 100 routines, some of them are for protection, smooth scrolling, modem routines and sound and color. Also a bootmaker, paddle and joystick test; read terminal, and auto dial and auto answer. Documented routines allow you to use them to build your own programs or use alone. This disk has a lot of tricks that are used in commercial software.

Side 2 contains several of the same routines for the 128 system but also a T&S editor for going out to track 66, along with a screen dump for the 80 colum mode and lots, lots more.

Side 1 C-64 **Side 2 128** All for $19.95

64-128 CROSS REFERENCE BOOK

This is the first book available of its kind. Complete cross-references used to covert 64 programs over to the 128 computer. Book is formated on the left side with the location and label name, and then on the right with the equilvent 128 location. The entire range of memory is covered starting at 0-Page going thru BASIC and then thru the Operating System. A must for the serious 128 user.

$12.95

AUTO LOADER

A cartridge that plugs into your expansion port that makes loading and working with the disk drive much **easier.** With AUTO LOAD you will never have to type any of the load commands again. The cartridge will not interfere with **any** of your programs and has three different ways to load them

1. Automatic mode allows you to set up a special file that has commands in it that you want the system to perform when power is first turned on. (Same as Apple's and IBM autostart files.)
2. If an auto-start file is not found then AUTO LOAD loads the directory and displays it in a menu format. Pressing one letter next to your selection loads and runs the program. Automatically!
3. Holding down different function keys while turning the computer on types in commands like (LOAD "*",8,1), (LOAD "*",8 + RUN), (LOAD"$",8 + LIST)

- Go straight into your application with no hassel
- Load wedge first, change colors then load application without touching the keyboard!
- **Great** for programmers, can be used to load up several utilities in a row!
- Makes sorting thru and loading several different programs very **quick.** (as with public domain, multi utilities disk etc...)
- **Easy** for kids that cant type yet.
- Comes with built in system reset switch

ONLY $19.95

NEW FOR C-64 and C-128

THE KEEPER

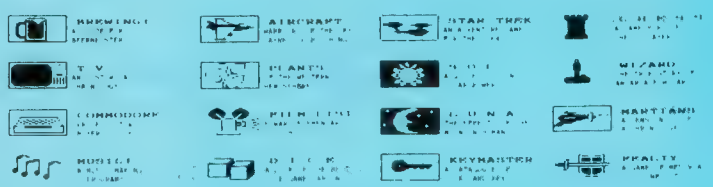
Revolutionary new technology enables virtual storage of 8192 bytes of high speed RAM. With write protect and in/out switches, the KEEPER adds new dimensions to your computing capability. Designed for the Commodore C-64 and C-128.

- Makes Auto-Start Cartridges of Your Own Programs
- Built-in Software Makes Use EASY
- Copy BASIC or Machine Language Programs
- Instant Program Recall
- May Be Used Over and Over
- Guaranteed for 1 Year

ONLY $39.95

GRAPHIC LABEL MAKER

Give your labels the professional touch. With Hi Rez Graphics make your own design or use one our 60 premade labels with easy to use on screen editor. You can insert up to three lines of text then choose the picture you want to put on the left hand side of the label. Then you can print out as many labels as you want. This has got to be the neatest label program out there and it's only $24.95



*Now works with Print Shop

*Also available — the x-rated Graphic package for the 64 and your print shop. There's 60 Hi Rez pictures — $24.95

1541 M.A.S.H.

Now you can service your own 1541 disk drive using 1541 M A S H. Save big bucks on repair bills. Rate the performance of your drive. Test and adjust RPM's. Test and adjust head alignment. Step by step instructions that anyone can follow. Pays for itself the first time you use it to adjust a misbehaving drive. No knowledge of electronics is necessary. All you needs is a screwdriver and 20 minutes.

NOW ONLY $19.95

128 80-COLUMN ADAPTER

An adapter that plugs into your RGG output that gives you 80-colums of monochrome text in the 128 mode.

$9.95

SWIFTERM AND MODEM

This is the best package anywhere!

SWIFTERM:
is absolutely the easiest terminal program available anywhere

- Works with the 1660, and Westridge Modem
- New printer and midwestern protocal
- Printer dump
- DOS commands access from menu
- Phone book
- Auto dial (with auto redial)
- 29K storage buffer
- Save to disk
- Standard ASCII up/down loading
- 300/1200 Baud

This is an excellent easy to use program for a very reasonable price

THE MODEM

Auto dial, auto answer, 300 baud modem that is 100% compatible with Commodores 1650 modem, so all our software will run with it.

Swifterm 64 and Modem for $35.95

So why buy just another terminal program when you can get a modem too!?!

SWIFTTERM 128

Same features as above but for 128. Also including a 48K buffer and a programable phone list. Faster speed using the 1571.

$29.95

WANTED: PROGRAM SUBMISSIONS

Megasoft is currently seeking quality program submissions for marketing on a national scale. We pay good royalties and can work several options. If you feel that you have something of interest, call (206) 687-7176 for more information. Unique utilities and hardware devices a plus.

64 BBS

Full performance board with lots of extra's not found on others. Two different versions to satisfy your needs

- Backroom password gives you access to 7 read and write rooms with 4 security levels
- Open chalk board, used to post messages by users.
- Secret highest level
- Auto message cycling
- Remote access for sysop
- Printer option
- 300/1200 Baud
- 2 Levels of security for up and down load
- New punter, X modem and midwest supported

$39.95

128 BBS

New for your 128, a complete BBS program with all the functions of the 64 version plus more

- A complete seperate sub-board
- User activity log
- Faster performance using the 1571
- Supports new punter and X modem protocols

Both boards are completely menu driven and easy to use. Several options can be set up according to the system operators choice. This is the most comprehensive system avialable anywhere.

$59.95

D-CODER

- Translates any machine language program into easy-to-ready English descriptions with complete explanations of each command
- Makes complete notations of all important memory locations accessed by the program (SID, VIC, MOS, KERNAL, etc.)
- Gives you three ways of accessing programs
  1. **Will read and list programs from DISK**
  2. **Will read and list programs from MEMORY**
  3. **Direct user input (from magazines, etc.)**
- Can be used to locate and examine any machine language program's protection routines!
- Can be used to easily break apart machine language programs for study and examination!
- Printer option for complete hard copy listings!

$19.95

You no longer need to be an EGGHEAD to read Machine Language.

N-CODER

THE PERFECT COMPANION PROGRAM TO D-CODER!

Allows you to easily make changes in machine language programs . . . right on the disk!

- Rewrite ability allows code to be altered and then rewritten directly to the disk!
- Features sector-by-sector scrolling assembly language display of machine language programs!
- Notation of ASCII text equivalents for easy spotting of embedded text strings!
- Handy reference display of all assembly language commands and their ML numerical equivalents!
- Byte splitter for easy splitting of decimal addresses into low byte-high byte format!

$19.95

GRAPHICS AND GAME DISK

A stimulating x-rated adventure game, complete with graphics representations. This is not your typical adventure game. FEATURES ANIMATED X-RATED CARTOONS

*Joystick required

$24.95

WAR GAMES AUTODIALER

1. **Auto Dial** will automatically dial a set of numbers you choose
2. **Review Numbers** will review numbers that were answered by a computer
3. **Save Numbers** will save numbers where a computer answered.
4. **Hardcopy of Numbers** will print out list of numbers where a computer answered
5. **LOAD Numbers** will load in numbers to continue where it left off
6. **Continue** will pick up dialing where it was interrupted

$29.95

Top Secret Stuff I and Top Secret Stuff II

Programed by Jim Drew

Are both collections of 20 programs per diskette (that works out to about $1.00 per program!) that help you explore and enhance your Commodore 64 and/or 128 and 1541 disk drive. Now you can unlock many secrets formerly known only to top machine language programmers by using these sophisticated "tools." If you have ever been curious about the inner workings of your computer system, now is your chance to dig in and find answers with the help of these programs. These collections of programs have gotten rave reviews from actual users, and we are sure that you, too, will be pleased.

The programs include on each diskette are listed below

TOP SECRET STUFF I

The Dock (view/repair disk contents)
Sync Checker (diskette)
Imbedded Track Number Creator
Disk Manipulation System
3 Minute Copy (backup program)
Diskette Matcher (compare sectors)
Unscratch A File (recover file)
View BAM (block allocation map)
1541 Read/Write Test
½ Track Reader
Header Reader (display disk header)
Sync Maker
Device Number Change (disk drive)
Electronic Arts Backup
Drive Mon (disk drive m/l monitor)
Diskette File Log (start-end address)
Write-Protect Sensor Test
Repair A Track (recover data)
Fast Format (10 seconds)
½ Track Formatter

$19.95

TOP SECRET STUFF II

RAM Test (test Computer RAM)
Copy $A000-$FFFF (under ROMS)
Display G.C.R. (All sector data)
Un-Write Protect (diskette)
Unnew Program
Wedge - $8000
Smooth Scroll (messages up screen)
Koala Dump (koala pad screen dump)
Disk Manipulation System
Disk Eraser (20 second clean wipe)
Split Screen (TWO screen colors)
Disk Protection System (stops copies)
Write Protect (diskette)
Boot Maker (autoboot BASIC programs)
Wedge - $C000
Diskmatcher II (high speed version)
No Drive Rattle (on reading errors)
3 Times Disk Drive Head Speed
Monitor Test (check video monitor)

$19.95

SOFTWARE PROTECTION HANDBOOK

4th Edition!

SOFTWARE PROTECTION HANDBOOK Fourth Edition! Now Available!

If you're **tired** of being harassed by **protected software** and too many **copy** programs then this is the book for you! This 250 page manual covers the gamut from legalities to protection methods to step-by-step back up procedures. Now you can learn both how to **protect and unprotect** software! The techniques covered include copying cartridges to tape or disk, tape protection, and disk protection. Disk protection covers error numbers 20, 21, 22, 23, 27 and 19 **plus** single track formatting, header modification, header swapping, half track reading and writing reading and modified bit densities, formatting illegal track/sectors, sync writing and **more!** Forth addition contains the most unusual and innovative protection analysis tool for the Commodore yet! - **not for Beginners** - This system expands your 1541 drive giving capability otherwise only possible for **professional** disk duplication equipment, now you can create or analyze exotic forms of disk protection. **'D.O.S. Kings' Take Note!** - Entire tracks of data can be read and written without regard to 'standard' sync and format. You are no longer limited to sector by sector searches. Whole track readouts reveal hidden data even when all or most of the sectors have been erased. Uncovers and writes data under errors, pulse coaded sync or data, hidden data and access codes, multiple track densities and more! This manual covers the complete implementation of the track trap system including necessary software and hardware documentation.

C-64 Book Only . . . . . **$19.95** US

Book & Disk of all Programs . . . . . **$29.95** US

This manual does not condone piracy

MACHINE LANGUAGE TUTOR

A step by step disk based program that covers all the basics of how to program in machine language. Coverage includes a interactive simulator giving a graphic example of how flags and registers are effected when a program is running. Twenty three lessons contain a wide range of information to include memory operations, the stack pointer and how interrupts work. This is the first tutorial of it's kind.

$19.95

Enclose Cashiers Check, Money Order or Personal Check. Allow 14 days for delivery. 2 to 7 days for phone orders. Canada orders must be in U.S. Dollars. VISA — MASTER CARD — C.O.D.

*Programs for C-64 $3.00 S & H on all orders

Software Submissions Invited

VISA

MasterCard

MegaSoft Limited

P.O. Box 1080, Battle Ground, Washington 98604

Phone 800-541-1541 • 24 hour BBS order line • 206-687-5205

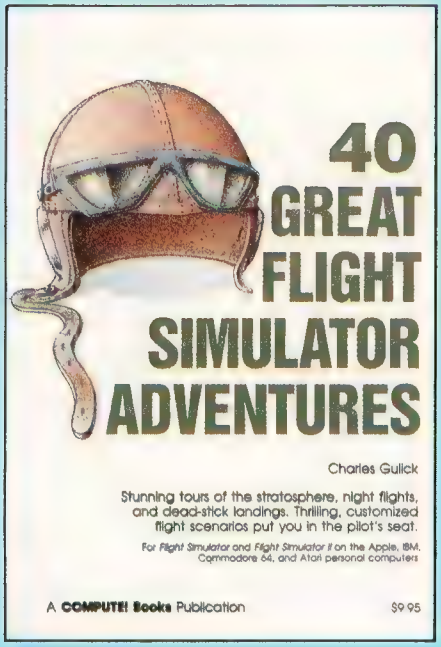
Tech. Line & Foreign & In Washington state orders - 206-687-7176

Discover the thrill of flying!

with COMPUTE! Books'

40 Great Flight Simulator Adventures

- Maneuver around the towers of the World Trade Center.
- Sightsee the Hudson River.
- Practice night flying and aerobatics.


40
GREAT
FLIGHT
SIMULATOR
ADVENTURES
Charles Gulick
Stunning tours of the stratosphere, night flights, and dead-stick landings. Thrilling, customized flight scenarios put you in the pilot's seat.
For Flight Simulator and Flight Simulator II on the Apple, IBM, Commodore 64, and Atari personal computers
A COMPUTE! Books Publication
$9.95

40 Great Flight Simulator Adventures
Charles Gulick
Forty exciting, customized flight simulator scenarios put you in the pilot's seat as you fly over bridges, around skyscrapers, and land at mysterious airports. *Flight Simulator* (IBM PC) and *Flight Simulator II* (Apple II, Commodore 64, Atari) are two of the most popular games/simulations for personal computers. With this book, you can experience flight adventures from the moment you load the program. Parameters set up each flight and a running commentary describes what you'll see (and where to look to see it). Ranging from the simple and straightforward to the advanced and even mystical, these 40 flights will open a new dimension to an already outstanding program.
$9.95 ISBN 0-87455-022-X

Note: *Flight Simulator* from Microsoft Corporation and *Flight Simulator II* from Sublogic Corp. are required in order to use this book. The book is designed to enhance the programs.

Please send me _____ **copies of *40 Great Flight Simulator Adventures* at $9.95 each.**
(ISBN No. 0-87455-022-X)

All orders must be prepaid in U.S. funds.

Subtotal	_____
NC residents add 4.5% tax	_____
$2.00 shipping and handling charge per book.	_____
Total amount enclosed	_____

To order this exciting adventure guide, mail the attached coupon with your payment to COMPUTE! Books, P.O. Box 5038, F.D.R. Station, New York, Ny 10150. Or call toll free 1-800-346-6767 (in NY 212-887-8525.)

☐ Payment enclosed (check or money order)
☐ Charge ☐ Visa ☐ MasterCard ☐ American Express

Name _____
Address _____
City _____ State _____ Zip _____

Please allow 4–6 weeks for delivery.

36302212

COMPUTE! Publications, Inc. abc
One of the ABC Publishing Companies

COMPUTE! books are available in the U.K., Europe, the Middle East, and Africa from Holt Saunders, Ltd., 1 St. Anne's Road, Eastbourne, East Sussex BN21 3UN, England.

If you've discovered a clever timesaving technique or a brief but effective programming shortcut, send it to "Hints & Tips," c/o COMPUTE!'s GAZETTE. *If we use it, we'll pay you $35.*

Internal Files

Daniel E. Shamo

Serious application programs that handle a lot of information often store the data in sequential files. But while you're working on a program, it can be frustrating to wait for it to reread the data file every time you make a change to the program, especially if the information is on tape. Here's a shortcut that can save a lot of time.

During the programming process, set up a representative sample of the variables in the form of DATA statements. Then, instead of OPENing the file and INPUTting the variables, you simply READ them directly from the DATA statements. Setting up "internal files" is considerably faster than reading a file from tape or disk. And it allows you plenty of opportunity to experiment with the screen displays, prompts, menus, and other subroutines.

When you're satisfied with the routines that work with the data, replace the READ with the usual OPEN/INPUT# combination and delete the DATA statements. If you don't have a utility for deleting lines, and they're numbered in a regular order, here's an easy way to get rid of them. Let's say lines 2100–2210 contain the DATA statements you want to excise, and they're numbered by tens. Enter this line in direct mode:

```
FOR J=2100 TO 2210 STEP 10:PRINT
 J:NEXT
```

The blank lines are printed to the screen. Now cursor up to the first number and press RETURN several times. The lines are instantly deleted from the program.

When you're testing a section that writes to a file, you can't easily reroute output to the internal file of DATA statements. But the screen can be addressed as device number three. So, if your program includes a line like **OPEN 1,8,2, "DATAFILE,S,W"** (to open a disk file for writing), you can temporarily substitute **OPEN 1,3**. Any subsequent PRINT#1 will write to device 3, the screen, instead of device 8, the disk drive. This has the added bonus of allowing you to view the results. Again, when the write-to-file routine is debugged and working, you would go back in and change it back to the original form.

A Flexible Rounding Function

David C. McKenzie

A programmer's nightmare might go something like this: You've volunteered to keep the statistics for a local bowling league. There are eight teams of five players, plus some substitutes. So you write a program that calculates handicaps, keeps scores, figures out best game and best series, and writes everything to data files. The program works perfectly and everyone is pleased with the results. Eventually, the season ends and a new one begins. But this time there are twelve teams of four players each.

As the team statistician and resident programmer, you find yourself faced with the awesome task of rewriting the whole program. You didn't write a "Bowling Stats" program, you created "Bowling Stats For Eight Teams Of Five Players." To modify it for the new season would require going in and changing all fives to fours, all eights to twelves. You realize you should have assigned a variable to number of players per team (NP=5) and another to number of teams (NT=8). Within the program, you could have looped FOR J=1 TO NP instead of FOR J=1 TO 5. You could have used DIM SC(NP,NT) instead of DIM SC(5,8), and so on.

The point is that using variables makes a program more general and easier to modify (this is called "soft coding," as opposed to "hard coding," which locks you into a certain value). Take rounding to the nearest penny, for example. The following line would suffice:

```
50 N=48.527616: PRINT INT(N*100+.5)
 /100
```

The expression within parentheses is evaluated first, and multiplication always happens before addition. So the value of N is first multiplied by 100, to get 4852.7616. Then 0.5 is added (for 4853.2616). INT turns it into the integer 4853. Finally, we divide by 100, resulting in 48.53.

What if you decide to change the program to round to the nearest dollar? You'd have to go to line 50 and change the formula, of course. And if your program does a lot of rounding, you'd have to change many different lines. A better way of handling rounding is to make the function into a subroutine:

```
600 NR=INT(NR*100+.5)/100: RETURN
```

Now, anytime you want to round to the nearest penny, you assign a value to NR (number to be rounded) and GOSUB 600. The program has become a little more general. To make it even more general, replace the subroutine:

```
600 PR=10↑DP: NR=INT(NR*PR+.5)
 /PR: RETURN
```

Before calling this subroutine, put the number to be rounded into NR and the precision (numbers to

the right of the decimal point) into DP. Enter the following program to see how it works:

```
10 FOR J=-2 TO 5: NR=48.527616:
   DP=J: GOSUB 600
20 PRINT J,NR: NEXT
30 END
600 PR=10↑DP: NR=INT(NR*PR+.5)
   /PR: RETURN
```

Note that when DP is −2, the subroutine rounds to the nearest hundred, and when DP is 2, it rounds to the nearest hundredth. If DP equals zero, the nearest integer is returned. By including general subroutines like this, you make it easier to make later modifications to the program.

Convert Sequential Files To BASIC On The 128

Mike Tavis

It takes but a few commands to create an ASCII listing file on disk. While a BASIC program is in memory, enter the following line:

OPEN 2,8,2,"*filename*,S,W": CMD2: LIST

After the cursor reappears, enter **PRINT#2: CLOSE 2**. Elsewhere in this issue is a utility that allows you to convert the Commodore ASCII file into true ASCII and vice versa.

The big advantage of ASCII files is that they allow you to use a modem to transfer programs between computers. (Sending a program to another computer is called *uploading*, while receiving a program is *downloading*.)

Up to now, conversion of such a file back into a tokenized program, a program you could RUN, required a machine language utility. On the VIC and 64, for example, you would have to read the file, print it to the screen, and use the dynamic keyboard technique to simulate pressing RETURN over the lines, to add them to memory.

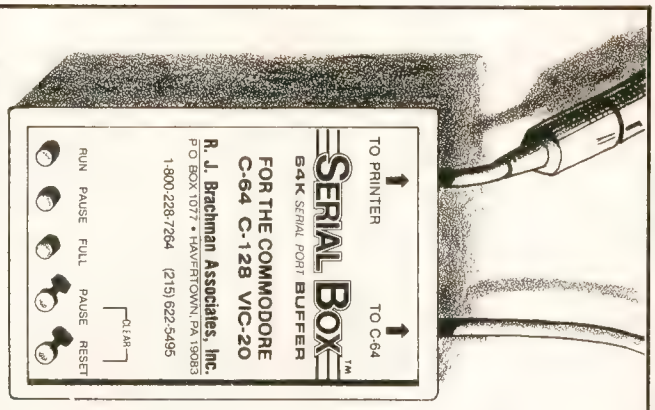
But the new operating system of the 128 makes tokenization very simple. On previous Commodores, pressing RETURN over a line caused the computer to close all open files. That's not true for the 128. So if you open the sequential file and perform a machine language CHKIN, the program is read directly into memory as if you were typing each of the characters. Here's what you enter (type NEW if you already have a program in memory):

BANK 15: OPEN 2,8,2,"*asciifilename*,S,R": SYS 65478,0,2,0,0

That's it. When the 128 comes to the end of the file, you'll see a SYNTAX ERROR message. Ignore the error and enter **CLOSE 2**. You can now type LIST to verify that the program is in memory. Before you run it, DSAVE the program.

You may occasionally receive a STRING TOO LONG error message, especially if one of the lines is longer than 160 characters, the size of the input buffer. If this happens, just enter **SYS 65478,0,2,0,0** again.

This method is also useful for merging two programs. Create an ASCII file of the first program, load the second program, and then enter the OPEN and SYS listed above. The lines from the sequential disk file will be added to the program in memory. If the two programs happen to share some line numbers (if both contain a line 60, for example), the line from the disk file will replace the line in memory.



DEALER INQUIRIES INVITED

SERIAL BOX™
64K SERIAL PORT BUFFER
is an intelligent 64K Serial Port Print buffer that works with ALL Commodore printers & ALL serial printer interfaces!

. . . and for ONLY $74.95 + Shipping

The Serial Box™ lets you compute while your printer prints.

Imagine downloading a bit-mapped screen such as Flexi-draw or Koala Painter in 27 seconds! You can dump 15 pages of text or a 35-page BASIC listing in 2½ minutes.

Oh yes, The Serial Box™ can even skip over perforations.

SEE YOUR DEALER OR CALL: 1-800-228-7264 FOR ORDERS AND INFORMATION
IN PENNSYLVANIA CALL (215) 622-5495 OR WRITE

R. J. Brachman Associates, Inc.
P.O. BOX 1077 • HAVERTOWN, PA 19083

Please add $3.00 for shipping and handling (USA and Canada). VISA, MC, Check or Money Orders accepted. C.O.D. add $2.50. PA residents add 6% (PLEASE ALLOW 4 TO 6 WEEKS FOR DELIVERY)

*Flexi-draw is a registered trademark of Inkwell Systems. Koala Painter is a registered trademark of Koala Technologies Corp. *C-64, C-128 & VIC-20 are registered trademarks of Commodore Business Machines, Ltd.

NEW UPDATED
DISK NIBBLER
VERSION 2.1

FOR COMMODORE 64 and 128 (in 64 mode)

- Copies 70 new 1985 disks not copied by the original ULTRABYTE DISK NIBBLER
- Copies 30 more disks than NIBBLER V2.0
- Copies 99+% of protected software

NIBBLER V2.1 EVEN COPIES ITSELF

For this reason, no refunds will be given

THREE NIBBLERS ON ONE DISK

- Single 1541 or 1571, copies in 3 minutes
- Two 1541's, copies in 60 seconds
- Dual MSD drive, copies in 70 seconds
- Both automatic and manual copy parameters for single 1541 or 1571

(Dual drive Nibblers are not quite as powerful)

$ 39.95 + $ 4.00 shipping & handling

Mastercard, Visa, Check or M.O., Calif. add 6.5% ($2.60) sales tax. Foreign orders / COD add $2.00. Payment must be in U.S. funds

UPDATES - Previous ULTRABYTE customers may order V2.1 for $20.00 plus $4.00 shipping. Owners of V2.0 may have their disk updated to V2.1 by returning the original V2.0 disk with $10.00 plus $4.00 shipping. Foreign add $2.00. No COD's on updates

To order, write or call 24 hr. order line
For information, write. Phone for orders only

ULTRABYTE (818) 796 - 0576
P.O. Box 789 LaCanada, CA 91011 USA

DEALERS & DISTRIBUTORS WANTED

Storytelling To Read

Fred D'Ignazio
Associate Editor

My six-year-old son Eric is struggling to learn how to read. But until recently he hasn't been making much progress. His teacher has set a goal for each first-grader to read 100 books by the end of the school year. Some of the kids are already halfway through, but Eric has hardly started.

Part of the problem is that Eric is bored with the books he's supposed to be reading. Most of them are in the Dick, Jane, and Spot category, written 30 years ago for an earlier pre–Star Wars, pre-GoBots generation of children. The story lines are thin, and the characters are not realistic or contemporary.

One evening while giving Eric a bath, he proudly showed me a range of mountains built out of soap bubbles. "This is Mount Everest," he said. "And this is Mount St. Helens." Suddenly, he lifted his hands, and shouted, "BOOM!," and Mount St. Helens erupted water and soap bubbles.

As I wiped the bubbles out of my ear, I marvelled at how good Eric was at creating verbal stories of his own. Maybe, I thought, he'd be more interested in learning to read if he were reading stories *he* had created. This reminded me of IBM's national "Writing to Read" project in schools, where kindergarten and first-grade children learned to read by first learning to write. Most of these kids learned faster than those who learned to read by traditional methods. IBM's "Writing to Read" is an expensive, schoolwide project. I decided to begin a low-budget home version of the project for Eric: "Storytelling to Read."

We began the project with *The Hobbit* text-and-graphics adventure game from Addison-Wesley (Consumer Software Division, Reading, MA 01867—$24.95, Commodore 64 version). Every night before bedtime, I accompanied Eric and his sister Catie up to their room. I turned off the lights, turned on a flashlight, and read J.R.R. Tolkien's book *The Hobbit* to them (the book comes with the software). One evening, we checked out *The Hobbit* on videotape and watched it at home. And each day, after school, we played *The Hobbit* game on the computer.

The game was an excellent choice. The program uses 900 words and "understands" 400 words. Many of the words in the game were words he was learning in school. And he was discovering new words—imaginative ones like *dwarf, cave,* and *dragon.*

Reading the book, watching the movie, and playing the game was a successful combination. Eric's reading improved dramatically. But we didn't stop there. To help him create his own stories, we tried three new Commodore 64 programs: *Build a Book About You!* ($24.95—Scarborough Systems, Inc., 55 South Broadway, Tarrytown, NY 10591, $24.95); *The Snoopy Word Processor* ($29.95—Random House, 400 Hahn Rd., Westminster, MD 21157); and *Bank Street Storybook* ($39.95—Mindscape, 3444 Dundee Rd., Northbrook, IL 60062).

Build a Book comes with two 30-page book "skeletons"—pages with color pictures but no story. You load the pages into your printer, then run the software. The program asks you questions about your child. Eric ran the program himself, and he told the computer his name, where he lived, where he liked to play, his best friends, his pets, and so on. When he finished answering, the computer printed two personalized stories with Eric, his pals, and pets playing the leading roles.

Then came the good part. When the computer finished printing, Eric took the pages, lined them up and stitched them together using a needle and thread that came in the package. Then he attached the pages to the spine of the book's hard cover with adhesive. With only minor aid from his parents, Eric made his own book in less than an hour.

Eric was now excited about books. But he still hadn't created his own stories from scratch. The last two programs we used allowed him to do this. *The Snoopy Word Processor* and *Bank Street StoryBook* are word processors (or "story processors") designed for younger children.

The Snoopy program came with a "Story Starter" and a "Picture Starter." The Picture Starter showed an animation of the Snoopy comic strip characters; and the Story Starter began with text, such as "Lucy said," or "Snoopy said," designed to stimulate an imaginative response from children. Eric loved these pictures and words, and he had no trouble creating stories around the pictures and words.

Bank Street Storyteller was the biggest hit of all—and the biggest challenge for Eric. Now he had to build his own stories completely from scratch. And he had to create illustrations, too.

The illustrations were the key. Eric loves to draw, and he often creates elaborate pictures which are really stories. We began each story by having him illustrate it completely. Eric's visual imagination is highly developed, so this was no problem. He created page after page of illustrations on the screen and saved them. Then he went back and created words to go along with the pictures.

At last all the stories were done. And they were successful, since Eric quickly learned to read each story by himself.

BASIC magic

String Variables In READ And DATA Statements

Michael S. Tomczyk

Michael S. Tomczyk is a former Commodore marketing executive and product designer. His recent book, The Home Computer Wars, *describes the rise of Commodore and is published by* COMPUTE! Books.

READ and DATA are two BASIC commands that go hand in hand and are used for a variety of purposes. This month, we'll look at some of the fundamentals which you should know before you begin using these commands. All of these examples use "string information" as data. Strings include letters, words, graphics symbols, and numbers not used in math calculations.

To start with, try thinking of the word DATA as representing a list. When you READ DATA in a BASIC program, you're actually reading a list or sequence of information. The READ command tells your computer to read the list in order, one item at a time. It can be a long list of DATA, or a short list. Even one item.

In our first example, our DATA is a list of words which we're going to use in a sentence. Type the program as shown and run it:

```
10 DATA CATS,DOGS,BIRDS,MICE,
   FERRETS
100 PRINT CHR$(147)
200 READ W$
300 PRINT W$
```

We begin by putting our DATA in the first line, with the items separated by commas. DATA can be put anywhere in your program, but it's usually placed either at the beginning or end of your program. This program will work exactly the same if you change line 10 to line 1000, putting the DATA at the end of the program.

Line 10 contains the list of information we want to include—in this case, a list or sequence of words.

Line 100 uses CHR$(147) to clear the screen.

Line 200 contains the READ statement. READ W$ tells the computer to go to the list of DATA and READ one item in the sequence. We use a string variable (W$) after the READ command because we're READing *string* information, but the name of the variable—W—is purely arbitrary. You could just as easily use another variable, X$ or R6$, for example. At this point the computer has read only one item in the DATA list.

Line 300 tells the computer to PRINT the DATA item on the screen, so the first word, CATS, appears on the screen. PRINTing the variable W$ is the same as PRINTing the first item from the DATA list.

What if you want to print the entire list? In this case, you can use a FOR-NEXT loop to read and print each item in order. To do this, delete line 300 and change line 200 as shown below (just type in the new line 200 and press RETURN—it will automatically replace the previous line 200).

```
200 FOR X=1 TO 4:READ W$:PRINT
   W$:NEXT
```

Now run the program to see the full list on your screen.

In Sequence

You can also use the DATA in various ways in your program after you read it. For example, let's take the first word in the list, which is CATS, and use it in a PRINT statement. To do this, change line 200 again, to the following, then run the program:

```
200 READ W$:PRINT W$" ARE VERY
   NICE."
```

Run the program. Again, using the variable W$ is the same as using the first item from the list. Now we come to something important: *Each time you read data from the data list using the same variable—such as W$—the computer reads the next item in sequence from the list.*

To see how this works, type in and run the following program:

```
10 DATA CATS,DOGS,BIRDS
100 PRINT CHR$(147)
200 READ W$:PRINT W$
300 READ W$:PRINT W$
400 READ W$:PRINT W$
```

When you tell the computer to READ W$ in line 200, it reads the *first item* in the DATA list, but when you do the same thing in line 300, it reads the second item, and in line 400 it reads the third item—and so on through the entire DATA list, however long that might be. The READ command always takes the DATA from the list in the sequence that the DATA appears.

Type the word NEW and press RETURN to erase the program, and type in this next variation:

```
10 DATA CATS,DOGS,BIRDS
100 PRINT CHR$(147)
200 FOR X=1 TO 3:READ W$:PRINT"I
   LIKE "W$:NEXT
```

Line 10 contains the DATA, which includes three items. Line 100 clears the screen. Line 200 contains the FOR-NEXT loop. FOR-NEXT loops are used to repeat actions in a BASIC program, as you may already know. Everything *between* the FOR command and the NEXT command will be *repeated* the specified number of times. We're using three repetitions in this loop. In this case, the action we're repeating is to read from the DATA list, then print a sentence using the item from the DATA at the end of the sentence. The variable W$ is the same as the DATA item. The W$ is outside quotation marks in the PRINT statement because variables must always go outside quotation marks.

The result is that the sentence is repeated three times, each time drawing a different item from the DATA list, in the order that the items appear in the list. It doesn't matter if the DATA is all on the

same program line or on different lines. The items will always be read in order, which is why the following program works exactly like the previous one:

```
10 DATA CATS
20 DATA DOGS
30 DATA BIRDS
100 PRINT CHR$(147)
200 FOR X=1 TO 3:READ W$:PRINT"I
  LIKE "W$:NEXT
```

Note that when you include DATA on different program lines, or if you have a lot of DATA and spill over to the next line, you must always begin the new DATA line with the DATA command, as shown.

Here's another quick example, just to show that you can include spaces in your DATA statements. Type in this program and run it, making sure to include one blank space immediately after the words CATS and LIKE.

```
10 DATA CATS ,LIKE ,PEOPLE
100 PRINT CHR$(147)
200 FOR X=1 TO 3:READ W$:PRINT
  W$;:NEXT
```

Spaces can be included as DATA like other string information. In this case, we put spaces after two items so they look better when printed in a sentence.

Note the semicolon in line 200. The semicolon holds things together. Because we're actually using three separate PRINT statements here, each PRINT statement—and each word from the DATA list—would normally appear on different lines on your screen. By cementing them together with a semicolon, we cause all three PRINT statements to be displayed immediately next to each other, on the same line. Many of the spacing problems experienced by beginning programmers can be solved by using a semicolon.

So far, we've been putting string information in DATA statements without using quotation marks. We've all learned that string information usually has to go inside quotation marks. String information in DATA lines is one of those rare exceptions where string information is used without quotes. You *can* put quotes around string information in a DATA line if you want and it won't affect your program—but, in at least one case, you *need* to use quotation marks.

Graphics As DATA

Some string information which you want to use as DATA must go inside quotation marks. The best example of this are graphics symbols. You can include graphics symbols in DATA statements, but to use them as DATA items, you have to place each symbol inside quotation marks. Try this example:

```
10 DATA"—"
200 READ G$
300 FOR X=1 TO 40:PRINT G$;:NEXT
```

Line 10 contains our one and only DATA item, which is a horizontal line graphics symbol, enclosed in quotation marks. To type the horizontal line, hold down SHIFT and press the * key.

Line 200 reads the DATA.

Line 300 contains a FOR-NEXT loop. Again, the computer does everything between the FOR and NEXT, which in this case means it will print the item from the DATA statement 40 times. The semicolon glues the graphics symbols together so they appear on the same line. (If you have a VIC-20, you may want to change the number 40 to 22 so the symbols stay on one screen line.)

You can use string information and graphics in the same DATA list, as in this example:

```
100 DATA 22 LINES,"—"
200 READ G$:PRINT G$
300 READ G$:FOR X=1 TO 22:PRINT
  G$;:NEXT
```

In this example, line 100 contains two items of DATA, the phrase 22 LINES, and the horizontal line graphics symbol. The symbol is enclosed in quotes, and both items still have to be separated by commas.

Line 200 reads the first item of DATA and prints it on the screen. Note that we used a phrase here instead of a word. The computer sees this phrase as a string of eight characters: two 2s, a space, and the five letters.

Line 300 reads the next item in sequence from the DATA list, and the FOR-NEXT loop prints 22 horizontal lines across the screen, which appear as a solid unbroken line.

REM: *Numbers such as 5, 22, or 265 are called "numeric" information when used for calculation purposes in your program, and are typically represented by a numeric variable, such as X or G3. Numbers can also be used as string information and represented by a string variable such as X$ or G3$. That's why the number 22 can be used in a phrase like "22 LINES" and represented by the string variable G$ instead of a numeric variable like G.*

If you want to experiment, try this example with different graphics symbols, or try mixing up several different symbols and displaying them in various ways on the screen. Something else to try is to put the phrase "22 LINES" inside quotation marks in line 100—you'll see that the program still works the same. Try putting color changes and other editing commands in a DATA statement (hint: put them inside quotation marks).

Finally, you can transfer DATA to your Commodore printer by OPENing the printer channel and using PRINT# to send the DATA to the printer. Here's how to modify the previous program to do that:

```
100 DATA 22 LINES,"—"
150 OPEN 4,4
200 READ G$:PRINT#4,G$
300 READ G$:FOR X=1 TO 22:PRINT
  #4,G$;:NEXT
400 PRINT#4:CLOSE 4
```

Everything remains pretty much the same, except in line 150 we have to OPEN the channel to the printer, which is always device number 4.

In lines 200 and 300 we change the PRINT commands to PRINT#4 followed by a comma to tell the computer to send information to the printer instead of the screen.

Finally, in line 400, we CLOSE the printer channel.

Next month, we'll continue our look at READ and DATA, and see how to find DATA in the middle of a DATA list.

COMPUTE!'s GAZETTE
TOLL FREE
Subscription
Order Line
1-800-247-5470
In IA
1-800-532-1272

Richard Mansfield
Senior Editor

If you're going to be programming in machine language beyond the very early (and generally brief) novice phase, you'll want to write some fairly lengthy and sophisticated programs. Perhaps you'll custom design a word processor or try your hand at creating a video game. When you get to this point, a map of your computer will be one of the most important tools at your disposal. It serves several useful purposes and can offer you invaluable shortcuts, particularly if you need to access peripherals.

Last month we published a map of the Commodore 128. Maps of the VIC and 64 have been published over the years and are available in a number of books. Especially useful are maps which go into detail about how the ROM routines work. However, this sort of thing fills a book: See COMPUTE!'s *Mapping the VIC* or *Mapping the 64*. And even with such books, you'll still also want to have a shorthand map like the one published last month for quick reference.

Finding Safe Zones

How can you best use a map? First, it tells you where you can safely store your programs and variables without interfering with space used by the computer itself. For example, assume that you're writing a program which needs to access the disk drive. To complicate things, you want to use about six, two-byte spaces in zero page (the lowest 256 bytes in memory) for your own program. ROM routines also make heavy use of zero page, but you can't use bytes they will be using since the ROM routines would then interfere with your data and mess up your pointers. The solution is to look at the map.

To solve the above problem, you'd notice that addresses 251–254 are unused by ROM on the 64 and VIC. On the 128, addresses 250–254 are safe. But we need more than this. Looking at the 64 map, you can see that addresses 163–177 are used for cassette tape work, so they're safe too. We'll be accessing the disk drive, but the cassette won't be involved in this program. That solves our problem.

On the 128, the cassette zero page usage is not as conveniently contiguous, but you can still find two-byte pairs which are safe. Also, if you're not using other ROM routines in your program, look for their zero page areas. For example, the floating point accumulators can often be used if you're not accessing math routines in ROM.

You'll also be able to stash things on the 64 (though not for zero page access) between addresses 49152–53247, a full 4K. On the 128, you can look at its map and safely store in places where your ML program won't be in the way. If you're not using sprites, you can put your program or variables between addresses 3584–4095. Also free for ML use is the foreign language and function key area between 4864–7167 or the section reserved for a BASIC program even when Bank 15 is operative (7168–16384). The 128 is a very RAM-rich machine, though, so you'll also be able to use most of Banks 0 and 1 even if you do require ROM routines. Just switch them in and out as necessary, or invoke the special long-distance LDA, STA, CMP, JSR, and JMP Kernal routines.

Calling ROM

The other main value of maps for the ML programmer is the access to ROM routines. It would be unnecessary—not to mention extremely time-consuming—to do *everything* yourself. Even the most fanatical cook, when claiming to have baked a cake from scratch, doesn't mean that he or she harvested the wheat and churned the butter.

It is both practical and quite common for ML programs to use the built-in routines, especially for complex tasks such as access to the disk drive and printer; for floating point arithmetic; or for common techniques such as transforming a two-byte integer (most ML work is done with integers) into ASCII characters (that can be printed to the screen as characters for, say, the score in a game).

Here is a 128 ROM routine you might want to experiment with. It allows you to control the screen just as if you'd typed the ESC key followed by one of the other keys. On page 370 of your *System Guide*, you'll find a list of codes which control the screen and cursor in a variety of ways. From within ML, all you have to do is be in Bank 15, put the character of choice into the accumulator, and JSR $C01E:

```
10 *= $B00;      start at address 2816
20 .O;           store bytes during
                 assembly
30 ;
40 LDA #0;       set Bank 15
50 STA $FF00
60 LDA #"@;      load the blank-to-end
                 escape code character
70 JSR $C01E
80 RTS
```

When you SYS 2816 after assembling this routine, the screen will blank from where the cursor is currently positioned to the bottom of the screen. There are 26 other escape codes, so, just by knowing about address $C01E, you considerably amplify your ML programming capabilities. Via this simple JSR you can freeze the cursor, change its shape, move it around quickly, and delete lines or whole sections, and a lot more. Next month we'll explore how to use jump tables and the Kernal.

Keyboard To Joystick Converter

David A. Dur

Did you ever
could have be
joystick instea
Here's a soluti
64 and 128 (in

Back in the da
there was no v
stick, so we al
playing games
But it often bec
game's controll
ent from anoth
a joystick port
64 was more th
play some of th
require keyboar
sionally still find a program or two which insists that you use the keyboard.

I wrote "Keyboard To Joystick Converter" as a solution. It allows you to use a joystick with Commodore 64 programs that don't provide for joystick control.

Plan A Or Plan B?

Type in Program 1 and save a copy before running it. Although it's written in BASIC, it includes a machine language routine in the form of DATA statements. When you run the program, it asks you to choose plan A or plan B. This selects where in memory to put the machine language to avoid interference with the main program. Plan A uses the cassette buffer. Plan B uses the free area at 758–767. For most programs, plan A works fine, although you should avoid this option if you're using a Datassette. If plan A doesn't work, rerun the program and select plan B.

You're next asked to enter the keys corresponding to each direction and the fire button for each joystick port. Let's say a program requires you to press the J key to move left and the K key to move right. When Keyboard Converter

e key for left,
asked to press
ss K. If there's
ck to move in
just press any

for both joy-
n asks for the
th. Joysticks
shape, and
y. Many joy-
contact be-
But some do
ty joysticks
e moment,
on of a sec-

ond, then make good contact again. This makes the computer think the joystick was moved twice in that direction. In some programs this causes no problem. But in others it may.

Keyboard Converter can make up for this by distinguishing between a break in the contacts and the true release of the joystick. It does so by sensing how long the contacts are broken. Generally a period of three jiffies (one jiffy equals one-sixtieth of a second) or less is a result of a break in the contacts. Any longer than that usually indicates a true release of the joystick.

When Keyboard Converter asks for maximum break length, press RETURN to indicate 3 jiffies. If you have any problems with repeating movements, you can increase the break length by typing a higher number.

Now move the joystick around. You should see the corresponding letters on the screen. Now you can now load and run a game, and use the joystick instead of the keyboard. Be sure not to press RUN/STOP–RESTORE after running Keyboard Converter as this will disable the joystick.

This program works by modifying the IRQ routine which is executed 60 times per second. It normally scans the keyboard and increments the internal clock. When Keyboard Converter goes into effect, however, the computer scans not only the keyboard, but also the joystick ports. If the joystick has been moved, the code for the corresponding key is placed in the keyboard buffer to simulate a keypress.

A Sample Program

For demonstration purposes, type in Program 2. It's a fast action game (based on "Worm of Bemer," which appeared in the April 1984 issue of COMPUTE!) that uses keyboard control. After using Keyboard Converter, you'll be able to control it with a joystick.

After typing in "Worm," save a copy. Run Keyboard Converter and select plan A. The controls are:

I — up
M — down
J — left
K — right

Now load and run Worm. In this game you control a worm and gain points by eating mushrooms which are placed randomly on the screen. The game ends when the worm runs over its own tail or into a wall. Sounds easy, but there's a catch. Your worm grows every time it eats a mushroom. This makes it increasingly difficult to keep from running over your own tail.

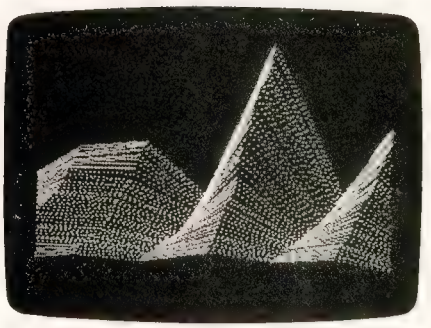
Lines 160 to 190 determine the direction keys. By modifying the number 25 in line 260, you can change the speed of the game.

See program listing on page 106.

The Coordinator

Lee Noel, Jr., Assistant Editor

This unusual program unlocks the creative potential of full hi-res on the 64. Convenient color control, straightforward syntax, and numerous other carefully designed features make it a particularly effective tool for the BASIC programmer.



Hi-res mountains created with "The Coordinator." (See Program 4.)

Colorful, detailed design work and the charting of math equations are two obvious uses for the 64's full hi-res display. Unfortunately, BASIC is poorly suited to these tasks. As a result, a large number of machine language aids have been developed to help the graphics programmer.

While they're all good, they tend to force the programmer into a restricted environment. "The Coordinator" is designed to preserve the entire range and flexibility of the BASIC programmer, and at the same time provide the ML speed and efficiency so useful in hi-res operations.

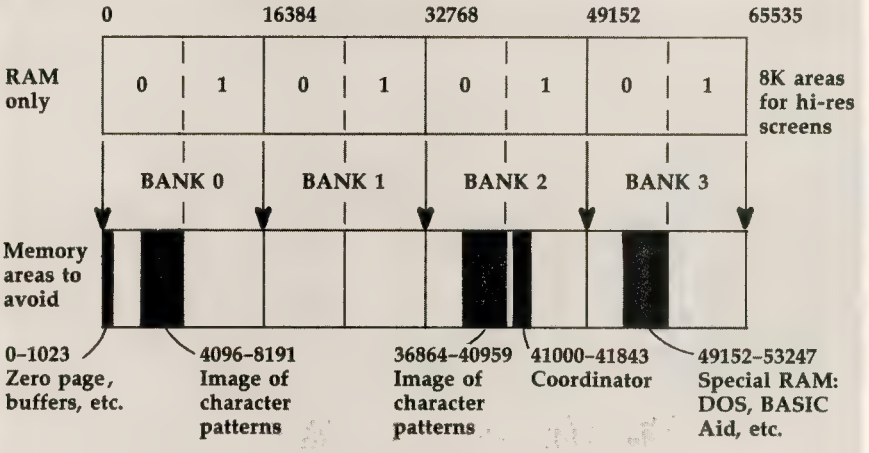
True hi-res is often neglected on the 64—its color system is hard to understand and difficult to master, but the results are well worth the effort. With The Coordinator, the effort is less and the understanding easier.

Getting Started

Start by typing in Program 1, a BASIC loader that POKEs The Coordinator into memory. It uses a special code to reduce your typing time. When you've typed in and run the loader without error messages, save a copy and then type **SYS 707** as shown on the screen. You should see a CAN'T CONTINUE error message. Try again. This time, there should be just the familiar READY prompt. Now, for one final check, type **POKE 1020,0:SYS 707.** The original error message should reappear. If you pass all these checks, there is almost certainly a working version of The Coordinator in memory.

Now you're ready to create a fast-loading version of the program.

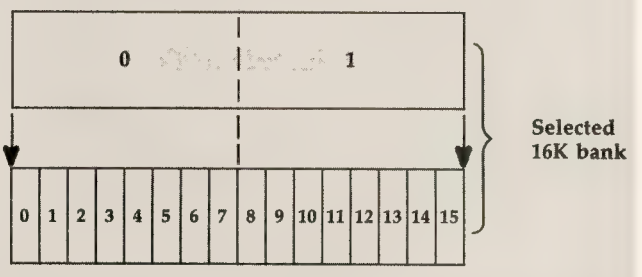
Figure 1a. Commodore 64 Memory Map



The Coordinator is located at 681–767, 1020–1023, and 41000–41843.

Figure 1b.
The two possible 8K hi-res screen locations

Figure 1c.
The 16 possible 1K color memory locations



The position of any hi-res combination can be described by three locations—Bank, Screen, and Color memory. The Demo uses 1, 1, 7 (See line 55).

Type NEW to clear out the loader. (Don't worry, neither NEW nor RUN/STOP-RESTORE ever has any harmful effect on The Coordinator.) Enter Program 2, Object Maker, and save a copy. It's set up for disk users; those using tape should change the 8 to 1 in line 30.

Now type RUN. The program creates two short files: A COORD .OBJ and B COORD.OBJ. When the READY prompt appears again, your files are done. Disk files are one and three blocks long, respectively. (Disk users should note that this short program does not read the error channel. Make sure you're properly prepared before running it.) Tape files have a combined save time of about a minute.

The two files make up the whole of The Coordinator. You no longer need the BASIC loader (Program 1). From now on, whenever you want to use The Coordinator, type:

```
LOAD"A COORD.OBJ",8,1 (for disk)
LOAD"A COORD.OBJ",1,1 (for tape)
NEW
LOAD"B COORD.OBJ",8,1 (for disk)
LOAD"B COORD.OBJ",1,1 (for tape)
NEW
```

(Tape users can generally ignore LOAD ERROR messages when loading B COORD.OBJ.) You're now ready to begin your BASIC program.

Since The Coordinator is tucked into out-of-the-way places, you can just forget about it now. All of BASIC memory is free, as are the cassette buffer and the overworked 4K of RAM at 49152–53247. (See Figure 1a.)

To make things clearer, type in Program 3, Demo. It's of general interest since it can be used as a framework for all your hi-res work. Line 10 contains the device variable D. Set it to 1 if you're using tape. Although the program is filled with REMarks, they are there for your convenience. They may be omitted if you wish. When you've finished typing it in, save a copy, but don't run it yet.

One Giant Programmable Character

Full hi-res turns your 64's display into one giant programmable character, 320 pixels across and 200 pixels high. The Coordinator treats this like a piece of graph paper, although there are no visible features. There's an X-axis on the bottom, running horizontally from 0 to 319, and a Y-axis on the left, running vertically from 0 to 199. The origin—the 0,0 start point—is at the lower left-hand corner. Thus, the graph is set up on a standard Cartesian system, the same kind you may have used to study coordinate geometry.

Any point can be described in terms of one X value combined with one Y value. For example, X=160 and Y=100 is a point at the center of the display. All your BASIC program has to do is generate some X and Y values. The Coordinator takes care of everything else.

Demo will show you how this works in practice. Lines 10 and 15 are merely for convenience. If you haven't already loaded your Coordinator files, they will. Make sure you have the disk containing A COORD.OBJ and B COORD.OBJ in the drive, or the tape rewound to the right place before running the Demo. (This step is skipped if the program is run more than once.)

Since it does most of its work automatically, The Coordinator has only four simple commands. These are:

1. **SYS 686** clears hi-res screen and color memory, and then plots the current values your BASIC program has specified for variables X and Y.
2. **SYS 707** plots X and Y.
3. **SYS 714** erases X and Y.
4. **SYS 681** resets The Coordinator if you change your hi-res setup. This means you can have several hi-res displays in memory at the same time.

There are two additional features. After using one of the above commands, you can PEEK(767) to see if the point was set (turned on) before the SYS. Any non-zero result from PEEK(767) indicates that the point *was* on. You can use this to avoid erasing points, or you may wish to detect collisions between certain points. The final feature enables you to determine if The Coordinator has initialized itself. If PEEK(1020) returns 64, it probably has. This can be useful in certain situations that crop up when you use the program in complex ways.

Lines 25 and 30 simply assign meaningful variable names to these addresses. You can, of course, use any names you like.

How It Works

How can The Coordinator do anything significant with these minimal commands? Run the Demo and watch.

Briefly, here's how The Coordinator works. Any time you SYS to it, it looks for and stores the current values of variables X and Y. If X and Y are not defined, they are treated as if they're zero. Remember, SYS CLEAR plots after it clears. You can avoid plotting a point by setting X and Y to values that don't appear on the screen. X=−1:Y=−1 work fine.

Offscreen quantities cause no trouble. If you tried to plot them with most utilities, there would be a chance that you'd corrupt your BASIC program or even lock up your computer. This can't happen with The Coordinator because it deals only with reasonable values. All others are rejected. Good values are automatically converted into integers for display purposes. As a result, you have complete freedom to plot experimentally. After all, you may be graphing X and Y to see what their values are: It would be a shame if out-of-range quantities

Figure 2. Coordinator Color Sources

	Color	Source	Notes
Full Hi-res	Background	53281	Can be set for each 8 × 8 cell.
	Plotting	646	Any bit on (set to 1) shows in this color. Only one color per cell.
Multicolor	Background	53281	Affects entire screen.
	First Plotting	646	Set for each 8 × 8 cell. Given by bit pattern 0, 1.
	Second Plotting	53282	Set for each 8 × 8 cell. Given by bit pattern 1, 0.
	Third Plotting	53283	Set for each 8 × 8 cell. Given by bit pattern 1, 1.

couldn't be accommodated safely. You're protected with The Coordinator.

Every time you use the program, it checks the color information stored at certain addresses of your 64. These addresses are assigned to variables in lines 40 and 45 of Demo. You'll notice that they represent the normal foreground (text) and background color registers on the 64. Why learn special new commands for color? Just use the familiar registers; The Coordinator gets all its color information from them. Figure 2 lists the important color registers.

In true hi-res, background and foreground colors are set individually for each 8 × 8 character-sized block of the display. This gives 1000 possible differently colored background areas, each of which can contain one contrasting plotting color. SYS CLEAR applies the colors in the registers to color memory, as well as clearing all lit pixels from the screen. As a consequence, a uniform background color is displayed. The other commands apply color information to whatever 8 × 8 cell a point is in. This explains the small rectangles and vari-colored lines you see as the demo runs. With a little thought, this type of screen can be beautifully colored, and can display a subtlety and fineness of detail not possible with the more popular four-color multicolor hi-res.

The truly observant will notice MFLAG in line 30 of the Demo. The Coordinator also works in multicolor hi-res. MFLAG is a flag used by Demo to turn multicolor mode on or off.

Look at line 55 and the subroutine at 185. These set up the locations of the hi-res screen and color memory. You do this from BASIC, so that you're in control. Full

What Good Is It If You Can't Save It?

A lot of thought and dogged programming may be required to produce successful hi-res screens. The effort is wasted if you can't save and reload them for future display or fine tuning. Luckily, there is a way to save and load hi-res screens from within your BASIC programs.

Begin by loading Demo and deleting lines 65–145. Then type in Mountain Demo, Program 4, and Save/Load Subroutine, Program 5, to form one combined program. Again, be sure to set D to 1 in line 220 if you're using tape. Also, tape users—and disk users who dislike Save with Replace—should change line 295 to:

```
295 SYSPCHR$(E)+SN$,D,1:POKE193,0
  :POKE194,B(OK)
```

(Disk users who leave the line intact will have the option of updating their work while keeping filenames constant.) Now save the combined program.

This larger program was used to create, save, and reload the colorful mountain at the beginning of this article. When run, the routine plots one of several kinds of mountain formations, and then offers you the chance to save the current formation or reload an earlier design. If you get something you like, save it by following the prompts. Filenames may be up to fifteen characters long. Otherwise, press RUN/STOP–RESTORE and rerun the program until satisfied.

You'll note that the mountains are drawn quite slowly. The Coordinator is very fast, but BASIC is lazily providing it with X/Y values for shading, rock formation, jaggedness, and several other factors.

When you save a mountain, make sure that you've got plenty of room on your disk or tape. A minimum of about 10K is stored by this system. The information is contained in three files (four for multicolor), denoted by your filename with a prefix of 1, 2, 3, or 4.

You can juggle the combined program around to suit almost any hi-res need. However, screens that lie under the ROM areas cannot be saved by this method.

Multicolor experimenters should note two things. Mountain Demo was written for true hi-res and may surprise you. More importantly, the multicolor mode 11 bit pair gets its color information from color memory, which starts at 55296. This area is affected any time the screen is cleared, as the Save/Load Subroutine does by printing E$ in lines 230, 290, and 345. Hence, one-third of the color information available in this mode may be scrambled. Adapting the Save/Load Subroutine to sidestep this problem can teach you a lot about hi-res graphics.

How It Works

Every BASIC programmer is familiar with saving and loading programs. This feature of the computer is built in, and is usually limited to the storage and retrieval of BASIC programs. But the Kernal routines that perform save and load, can be used anywhere in memory. All it takes is an adjustment of pointers that normally keep track of where your BASIC program is.

The method used here, and in Object Maker, and at the beginning of Demo, is an adaptation of that used by Raeto West in chapter 6 of his reference, *Programming the Commodore 64* from COMPUTE! Books. The programs below show how the system works. Note that any address on the 64 can be represented in the following way:

```
Address = Low Byte + (256 * High
  Byte)
```

A byte can have any whole number value in the range 0–255.

To Save:

```
10 SYS 57812"FILENAME",D,1 :REM
   SET FILENAME
20 POKE 193,low byte of start address
   :POKE 194,high byte of start
30 POKE 174,low byte+1 of end address
   :POKE 175,high byte of end
40 SYS 62957 :REM SAVE
```

To Load:

```
10 POKE 147,0 :REM SET LOAD FLAG
20 SYS 57812"FILENAME",D,1 :REM
   SET FILENAME
30 SYS 62631 :REM LOAD
```

Lines 295–330 of the Save/Load Subroutine show the method in action.

As you can see, there's no interference with normal program flow, and the routines are fast and flexible. Try them, and they'll soon become indispensable.

memory flexibility is still available. The Coordinator's CLEAR and RESET functions, or an initial PLOT or ERASE examine the necessary registers and adjust themselves accordingly. Figure 1 explains the possible arrangements graphically.

By this stage, you'll probably have a good idea of what's going on as Demo runs. When it's over, one of the three sine waves disappears; and you can press any key to return to a normal display. (This is the function of the remaining lines of the program, 155–175.) You can also use the RUN/STOP–RESTORE combination at any stage. Now rerun the program with MFLAG set to one. You'll see that the differences are sweeping, but Figure 2 should help you out.

Multicolor works by having only 160 double-wide (two pixel) X values. These fat coordinates give extra color information to the computer. Since The Coordinator is mainly for use in true hi-res, you must specify both pixels yourself.

In essence, it's easy. The first pixel of a pair must have 0 or an even number as X coordinate. (Coordinator X coordinates are always 0–319.) Keeping that in mind, here's how to obtain the different colors:

(X starts as an even coordinate, Y has no effect on color.)

1. Bit pattern 01 gives color in address 646. SYS ERASE:X=X+1 :SYS PLOT

2. Bit pattern 10 gives color in address 53282. SYS PLOT:X=X+1 :SYS ERASE

3. Bit pattern 11 gives color in address 53283. SYS PLOT:X=X+1 :SYS PLOT

You may want to assign priorities by skipping the erase function or checking for previously set points. The need for this will become obvious as you use the program. Where X values are out of your control, you'll want to use a function like that defined in line 125. This will ensure that the X coordinates are even.

A few final notes may be useful. The Coordinator can plot under ROM, so no BASIC memory need be sacrificed to the display. If you set the variables in line 55 to 3, 1, and 5, respectively, The Coordinator will plot your screen under the Kernal and color under the SID registers.

While displays located under ROM are always safe from interference from BASIC, those in BASIC RAM may need to be protected, depending on the length of your program and the amount of memory it uses for variables. Another point—if you reset your computer using a cold start, SYS 64738, you'll wipe out the low portion of the program, and you'll need to reload A COORD.OBJ.

Finally, no matter how helpful a utility is, bugs will still creep into your hi-res programming. You may need to check the normal screen for error messages, so you'll want to avoid the RUN/STOP–RESTORE combination, which clears the screen. If you use the Demo framework, just press RUN/STOP, and type GOTO 170. You'll instantly flip back to the normal display and be able to read the error message. The Coordinator should help make this procedure a rare one.

See program listing on page 103.

Storage And Display:
Using Peripherals With The 128

The two most important peripherals you'll use with your 128 are a disk drive and monitor. Here's some helpful information on the 1571 drive and what video display options are available. An excerpt from Chapter 4 of the newly released *COMPUTE!'s 128 Programmer's Guide*.

Split Personality

As you probably know, the 1571 drive has two separate operating modes. It can be either a fast, double-sided drive (1571 mode) or a slower single-sided drive (1541 mode). In ordinary circumstances, DOS automatically uses 1571 mode when the computer is in 128 mode, and 1541 mode when you switch the computer to 64 mode with GO 64. However, it's possible to switch the drive from one mode to another under program control. The following program switches from 1571 mode to 1541 mode.

```
10 OPEN 15,8,15
20 PRINT#15,"U0>M0"
30 CLOSE 15
```

After you run the program, the drive will read and write to the top side of the disk alone, just like a 1541. To return to 1571 mode, replace line 20 as shown here and rerun the program:

```
20 PRINT#15,"U0>M1"
```

You can also switch from one read/write head to another in a program. Switch your drive to 1541 mode, then format a new disk using the disk name SIDE ZERO. Now replace line 20 as shown here and rerun the program:

```
20 PRINT#15,"U0>H1"
```

Now format the disk again using the disk name SIDE ONE, then read the disk directory.

Replace line 20 with this line and rerun the program:

```
20 PRINT#15,"U0>H0"
```

At this point, the disk directory should show SIDE ZERO. You now have a disk formatted on both sides in 1541 mode. Either side may be accessed by changing disk heads as shown above. If you have old single-sided disks around, this is one way to extend their usefulness. Note, however, that the second side cannot be read in a 1541 drive. It is only readable by a 1571 drive, which has two read/write heads rather than one.

Why the 1571 Is Faster

A 1541 disk drive can read a disk pretty quickly. That is, it can copy data from the surface of the disk to its internal memory fast enough. But it transfers data to the computer at a much slower rate. The problem lies in the 1541's communication protocol, which Commodore has fittingly dubbed "slow mode." There are now an abundance of Commodore 64 programs which increase the speed of the 1541 drive. Such utilities reprogram both the drive and the computer to accelerate the data transfer rate, at the risk of less reliable communications. The 1571 offers much faster transfer modes, and we'll show you how to access them under program control. But you first need to understand some simple facts about serial data transfer.

Most Commodore peripherals, including 1541 and 1571 drives, attach to the computer through a serial communication bus. The term *bus* is a jargon name for "group of wires," and *serial* means that only one bit (logical 1 or 0) of data can move along the bus at a time. To send a byte of data over the serial bus, a device first has to break the data down into its eight component bits. This sounds slower than it really is. Some serial communication systems—the Ethernet local-area network, for instance—are very fast. But there's one reason why Commodore's serial bus is so slow. Commodore computers built before the 128 don't use any special-purpose hardware for serial bus communications. Instead, the computer's microprocessor executes a program to convert a byte to bits and send both the data and associated control signals (like "Here's another bit" and "I'm done, now it's your turn to talk") down the bus. Since the microprocessor isn't specifically designed for such operations, it can't do them as fast as a special-purpose serial device.

The 128 and 1571 use a new system called *fast serial mode* to relieve the microprocessor of most serial communication chores. In the original serial protocol, one wire in the serial bus cable was named—Service Request (SRQ)—but never used. Now this wire has been put to work carrying a high-speed clock signal to accompany data sent at a faster rate. Since the clock signal and the data move faster than the microprocessor can follow, the Complex Interface Adapter chip at location $DC00 (CIA #1) assumes more responsibility for communications. The CIA's serial data register (SDR) at location $DC0C was unused on the 64. But in the 128 it reads and writes to the serial bus's data line. Thus, in the 128's fast serial mode the most speed-critical tasks are done by hardware that was unused (or underused) on the 64.

Why Learn About Fast Mode?

Some people—Commodore's programmers, for instance—have to know the details of serial communication backward and forward, but you can ignore all the bits and bytes and three-letter words and still benefit from fast serial mode. Every serial input/output routine in the 128's operating system has been written to use fast mode whenever it can. Whenever a serial device is active, the 128 checks to see if it can handle fast mode. Whether you access the device from BASIC or machine language, fast mode will be used if you have a 1571 connected to your 128.

For some disk operations, the 1571 is even faster because of new *burst mode* disk access commands. In conventional disk access, each request for data from the drive only returns one byte. When you're loading a large file, the computer spends most of its time saying "next byte, please" over and over again. Burst commands, on the other hand, tell the disk drive to pass many *blocks* (256-byte packages) of data without any further instruction. These commands can operate on as many as 256 blocks of disk data at a time. There is also a new fastload command that reads a complete disk file in one operation. As CP/M users will be glad to learn, burst mode is also available with any command that relates to MFM-formatted (non-Commodore CP/M) disks.

Since the computer's LOAD routine knows about fastload, ordinary BASIC commands like LOAD, DLOAD, and BLOAD (as well as ML routines which call Kernal LOAD) use burst mode if it's available. Unfortunately, since there is no corresponding fastsave command, all save operations transfer data at the normal byte-by-byte rate.

Video Displays

Like virtually every other microcomputer, the Commodore 128 communicates with you, the programmer, chiefly through a *monitor* or some type of display screen. Several options are available to accommodate a wide variety of needs. (The use of the term *monitor* to describe a dedicated video display should not be confused with the use of the same word to describe the built-in machine language control program. It's an unfortunate quirk of computerese that monitor has two different uses, but both stem from the same idea: Video monitors let you monitor (watch) the output of your programs, while machine language monitor programs let you "see" machine language.)

The least expensive alternative is to connect the computer to an ordinary TV, using the cable and switch box supplied by the manufacturer. The RF (Radio Frequency) modulated output of the computer contains both audio and video signals, which the TV receives through its antenna input like an ordinary broadcast signal. Though it has the advantage of low cost, a TV hookup rarely provides as clear a display as using a dedicated monitor. The RF cable acts as an antenna of sorts, picking up stray signals from the general vicinity—including the radio frequency waves generated by the chips in your computer and associated peripherals. In the past few years, an increasing number of combination

TV/monitor devices have appeared on the market. These are essentially televisions with extra connections for direct input from a home computer or video-recording device. In monitor mode, the device bypasses the TV circuits that receive broadcast signals, usually providing a display equal to that of a dedicated monitor.

If you have owned or used another Commodore computer before purchasing your 128, chances are good that you're familiar with the most popular type of dedicated monitor—the *composite* monitor. This type includes the Commodore 1701 and 1702 monitors (and many similar non-Commodore devices), which display an excellent image in 40-column mode. These monitors are connected to the computer through the eight-pin video connector at the computer's rear. Commodore composite monitors usually produce the best picture through the rear connectors, which split the color portion of the signal into separate chroma (color) and luma (brightness) signals, rather than those in the front of the device.

A monochrome monitor, though it provides no color (and often no sound), offers another inexpensive alternative. For a 40-column display, simply connect the luma output plug of the video output cable to the monitor's input (luma is essentially the video signal stripped of its color information). A diagram of the pins in the video output appears in your *128 System Guide*. If you're not sure which plug is luma, go ahead and experiment. You can't harm either device by momentarily connecting the wrong plug to the monitor. Monochrome displays are usually very sharp—more distinct than the best display produced by a composite monitor.

The third major type of monitor is the RGBI (Red/Green/Blue/Intensity), in which a separate signal is provided for each of the three primary video colors—red, green, and blue. The 128's 80-column display is in RGBI format. Since the nine-pin RGBI connector at the rear of the 128 is much like that on an IBM PC or PCjr, you should be able to use any color monitor compatible with those machines. Besides providing an extremely clear image, an RGBI monitor gives you 80 columns of characters on the screen—ideal for word processing, spreadsheets, and so on. The Commodore 1902 monitor, designed expressly for the 128, is a dual monitor: You can switch it from 40-column composite mode to 80-column RGBI mode simply by pressing a switch.

Though it requires making your own connector cable, you can get an acceptable 80-column monochrome display on a Commodore 1701 or 1702 monitor. The first step is to purchase a standard male nine-pin D connector (Radio Shack part #276-1537 is acceptable), a length of shielded coaxial cable and an ordinary RCA phono plug. As shown on page 352 of the *Commodore 128 System Guide*, pin 1 of the RGBI connector is ground, and pin 7 is monochrome output. (Note that the diagram on page 352 shows the pins as if you are *inside the computer looking out*. The pins of the plug you buy should be numbered; just look for pins 1 and 7.) To make an 80-column cable, you need only connect pin 7 of the D connector to the signal (inner) portion of the RCA plug and connect pin 1 to the ground (outer) portion of the plug (via the coaxial cable, of course). If you don't know how to do this yourself, any friend with a soldering iron and some electronics experience should be able to do it for you.

A homebrew cable of this type produces an excellent 80-column image on any monochrome monitor that accepts composite output, and an acceptable display on a Commodore 1701 or 1702 monitor. To use it with a Commodore composite monitor, turn the contrast down and plug the RCA connector end of the cable into the VIDEO connector on the front or the LUMA connector on the back. The ordinary light-on-dark display will probably not be very readable: Press ESC-R to switch to dark characters on a light background. Though it's not quite RGBI quality, the image is definitely usable, and gives you access to 80 columns at a cost of only a few dollars.

IS BACKING UP COMMODORE SOFTWARE DRIVING YOU CRAZY?

Now you can Back-Up virtually all 64/128 Software with our NEW 1571 Clone Machine

(requires a Commodore 128 with 1571 drive)

Months of R & D have gone into our 1571 GCR CLONE MACHINE so that you now have the ability to reproduce GCR signals on the disk. This way you are assured that you're copying the most rudimentary signals placed on the disk allowing you to back-up 64 Software, CPM Software, and 128 Software. The complete package includes:
1) GCR COPY, 2) COMPLETE DENSITY UTILITY, 3) DIRECTORY UTILITIES (rename, delete, copy file, etc.), 4) AUTO BOOT MAKER (for 64 and 128 Software), 5) EXPANSION MODULE SECTION (for future upgrades.)

ONLY $49.95*

*(Send us any old copy program and we'll give you $10.00 credit so your cost for 1571 Clone Machine is only $39.95)

THE NEW CLONE BUSTER Cartridge for the 64 or 128 (in 64 mode) is now the best memory capture device available. Snapshot your software and save it out to the standard Commodore DOS. Will back-up most 64 software and remove annoying error tracks and difficult to load protection.

ONLY $49.95

Micro-W. DISTRIBUTING, INC

VISA MasterCard

CALL: (201) 838-9027
1342 B Route 23
Butler, N.J. 07405

ASCII Teleconverter

Ken Stange

If you'd like to telecommunicate with a non-Commodore computer user, here's a short, easy-to-use program. It converts sequential files from standard ASCII to Commodore ASCII and vice versa. For the 128, 64, VIC and Plus/4.

Commodore ASCII codes are slightly different from standard, true ASCII. (ASCII—American Standard Code for Information Interchange—is a group of numeric codes designed to represent numbers, letters, punctuation marks, and control codes, such as carriage returns, linefeed, backspace, end text, and so on. This standardized code was developed so that various machines—originally teletypes—could communicate.) Although most computers use standard ASCII, Commodore computers do not. As long as you don't attempt to communicate with a non-Commodore computer, this difference is inconsequential. However, telecommunications permits you to transfer files from non-Commodore computers to your own disk, and standard ASCII is, logically enough, the standard format. This is where a problem arises.

Apple To Commodore And Vice Versa

Let's say a friend who owns an Apple wants to send a sequential file listing of a program he wrote (so you can translate it), or even an ordinary text file. Unless your terminal software automatically translates standard ASCII into Commodore ASCII, you'll find that your word processor or text editor doesn't work properly. That's where this short utility program can help.

"ASCII Teleconverter" converts a standard ASCII file to Commodore ASCII for reading by your text editor. It also converts a Commodore ASCII file to standard ASCII for uploading to another type of computer. Note that *SpeedScript*, *WordPro*, and some other word processors cannot be used to read the converted files because they use program files instead of sequential files, and screen codes instead of ASCII.

Easy To Use

After typing in the program, save a copy. To use it, load it and type RUN. You're first reminded that you need to have room on your original disk for the converted file. Next you're asked to choose if you want the converted file to be standard ASCII or Commodore ASCII. Press S or C. Another prompt asks you for the name of the file you wish to convert. This must be a sequential file. After entering the filename, you're asked to insert the disk that contains the file to be converted and press R when ready. A message will inform you when the conversion is complete. Last, you're offered a chance to convert another file. It's a simple process that involves only a few keypresses.

The filename of the converted file is the name of the original file with .S or .C added. For example, if the original filename is MENU, the name of the converted file is MENU.S if you selected standard ASCII format, or MENU.C for Commodore ASCII.

ASCII Teleconverter works only with sequential files. If you want to transfer a Commodore BASIC program to another brand of computer, you must first convert the program file to a sequential file. To do this, load the program and type:

```
OPEN 8,8,8,"0:filename,S,W": CMD 8:
  LIST
```

This LISTs the program to disk under the name you provide in place of *filename*. Remember, this name must be different than the program filename if you're writing to the same disk. When the cursor reappears, type:

```
PRINT#8: CLOSE 8
```

When the disk drive stops spinning, load and list the directory. You should see the sequential file you created. Now run ASCII Teleconverter to convert this Commodore ASCII file to standard ASCII. Then use your terminal program to transfer the converted file to the other computer via modem.

See program listing on page 101.

Cataloger

Kevin Mykytyn, Editorial Programmer

This program helps you organize your disk library by making it easy to find any program on any disk. Included are options to print out a master directory and alphabetically sort all filenames. For the Commodore 128, 64, Plus/4, and 16.

After owning a computer and disk drive for a while, it doesn't take long before you find yourself inundated by programs and disks. No matter how well your disks are organized, you may still find yourself loading several directories searching for that one program. Cataloger offers a practical solution. It's a straightforward, menu-based program that creates a master directory for all your disk-based programs. Several extra features make it especially useful.

Managing Hundreds Of Files

Cataloger is written entirely in BASIC and runs on the 128 (either 64 or 128 mode), 64, Plus/4, and Commodore 16. As listed, Cataloger can handle up to 800 filenames. If you're using a 128 in 128 mode, it can handle up to 2000 filenames. On a Commodore 16, only 400 filenames can be managed. To change the number of filenames for either of these computers, replace the 800 in lines 10 and 370 with the appropriate number. (Commodore 64 and Plus/4 owners should type in the program—with the 800 filename capability—as listed.)

After you've typed in the program, save a copy. To use it, type RUN. A menu of nine choices is displayed:

1. CATALOG A SET OF DISKS
2. SEE ALL FILE NAMES
3. PRINT ALL FILE NAMES
4. SORT NAMES ALPHABETICALLY
5. CREATE A SEQUENTIAL FILE
6. CREATE A PROGRAM FILE
7. LOAD AN OLD FILE
8. DELETE A DISK
9. START NEW FILE

If you're using the program for the first time, choose option 1, Catalog A Set Of Disks. You'll then be asked for a disk name up to 16 characters long. This should be the name on the label of the disk you wish to catalog. Put the disk in the drive and press RETURN. The directory of the disk is displayed on the screen and the filenames are entered into the master directory. Next, you're asked whether you want to continue or quit. If you have more disks to catalog, press any key. Otherwise, type Q to go back to the main menu.

After entering all the disks you wish to catalog, you can view the master directory. Option 2, See All File Names, displays the master directory on the screen. You can also print it out on any Commodore printer using option 3. Make sure the printer is turned on before you choose this option.

The filenames are stored in a format slightly different from a standard disk directory. The filename is followed by the number of blocks used then the disk name.

Once you've viewed the directory, use option 5, Create A Sequential File, to save it. Choose this option if you wish to make changes later to the master directory. (The READ command of "MetaBASIC" or "BASIC Aid" allows you to view the master directory in this format.)

Option 6 also saves your master directory to disk, but instead of creating a sequential file, it creates a program beginning at line 100. Whenever you wish to view the master directory, you can load the program created. (With the FIND command of "MetaBASIC" or "BASIC Aid," you can search the directory for a specific program.)

Adding, Deleting, And Sorting

At some point you'll want to add or delete disks from your master directory. Options 7 and 8 are used for this purpose. Option 7 is used to load any directory stored in sequential file format (with option 5). After loading a file, you can choose option 1 and all new filenames will be appended to the old directory. Make sure you save your changes to disk when you're through.

To delete a disk from the master directory, choose option 8. In order for this option to work correctly, the directory must be *unsorted*. If you wish to have a sorted master directory on disk, you should first save it unsorted.

The delete option removes all filenames from the disk name specified. Therefore it's important that all disks have a unique name. If you've made changes to a disk and wish to enter the changes in the master directory, use option 8 to delete that disk, then use option 1 to enter the newer disk version.

You'll find it easier to locate a specific file if the master directory has been sorted. Once the file has been saved in sequential file format, use option 4 to sort the names.

To delete the directory in memory and start a new directory, use option 9.

See program listing on page 101.

VIC Dump

Screen Dump To Printer

Henk de Bruyn

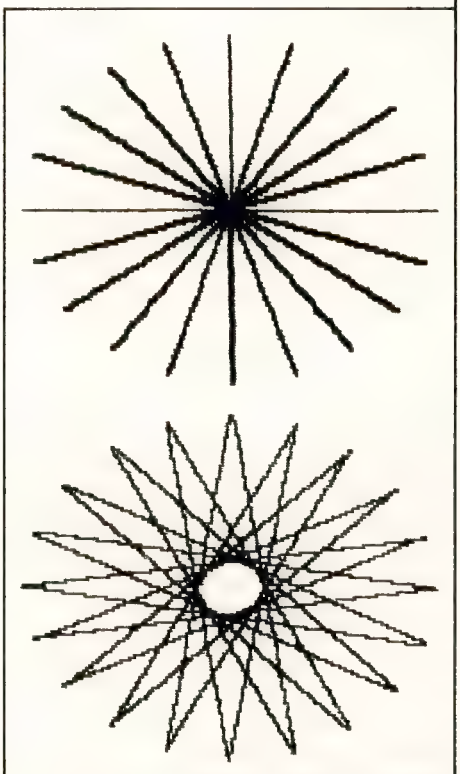
This short machine language program, only 251 bytes long, hides itself in memory and lets you dump any screen from your VIC-20 to your Commodore printer—even screens with custom characters and Super Expander graphics. It works on the unexpanded VIC with a Commodore 1525 or MPS-801 printer.

"VIC Dump" enables you to make an exact replica of the computer screen on your Commodore printer. You can make printouts of games, graphics, program output, almost anything.

It's designed to work with the unexpanded VIC-20 and either the VIC-1525 or MPS-801 printer. In their normal mode, neither of these printers prints true VIC characters because they have a 6 × 7 character matrix and the VIC has an 8 × 8 matrix. Therefore, to get true VIC characters and graphics, the printers must be used in their graphics modes.

That's how VIC Dump works. It generates a 100 percent resolution screen dump in just under two minutes.

VIC Dump is a semi-intelligent program. Characters which are invisible (same foreground and background color) will not be printed. VIC Dump automatically finds the number of screen columns and rows (normally 22 × 23) and the character matrix size (the normal 8 × 8 or extra-large 8 x 16). It works with user-defined custom characters and any video matrix address.



There are only two defects—some garbage is printed at the end of the printout, and multicolored characters are not reproduced well. (The multicolor bit of the color code is simply ignored, so the character appears in high resolution.)

Activating The Program

Follow these instructions carefully when using VIC Dump.

VIC Dump is written as a BASIC loader, a BASIC program which creates the machine language program in memory. Be especially careful when typing the DATA statements because these are the machine language codes. A mistyped number could lock up the computer, so be sure to use the "Automatic Proofreader" and to save VIC Dump on tape or disk before running it for the first time.

Here's the general procedure to follow:

1. Load VIC Dump, but do not RUN yet.

2. Type **POKE 55,0:POKE 56, 28:CLR**

3. Press RETURN.

4. Type RUN. After a few moments, the message SYS 6917 appears. This is the command to activate VIC Dump. Whenever you type SYS 6917 and press RETURN, whatever is on the screen will be dumped to your printer.

5. Load and run the program you want to dump to the printer. Use SYS 6917 to start the dump.

A slightly different procedure must be followed when using VIC Dump with the Super Expander cartridge:

1. Load VIC Dump, but don't run it yet.

2. Type **GRAPHIC2:CLR:GRAPHIC0**

3. Press RETURN.

4. Type RUN. After a few moments, the message SYS 3845 appears. This is the command for activating VIC Dump with the Super Expander.

Tips On Using VIC Dump

One problem might have occurred to you already: If you must type a SYS command to activate VIC Dump, how can you enter the command while the program you want to dump is running? Also, won't the SYS command itself be dumped to the printer if you type it on the screen?

To answer the second question first: Yes, the SYS command will be dumped to the printer if you type it on the screen. VIC Dump captures *everything* on paper. But don't worry, there's a way around this, and it solves the first problem, too.

The trick is to embed the SYS command within the program you want to dump. Then when you run the program, it dumps itself to the printer when the appropriate image is on the screen.

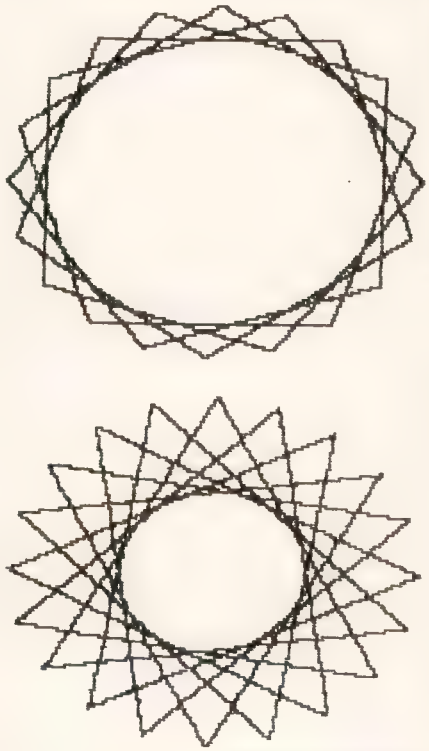
For example, look at this game-screen figure.

```
LOADING "VICDUMP"
250
SYS 6917
READY
SYS6917
```

```
G O B L I N
HS= 0

O=LEFT                P=RIGHT

G O B L I N
HS= 0
```



This is a screen dump of a BASIC game which appeared in the GAZETTE's sister publication, COMPUTE! magazine. Notice that even the custom characters were reproduced by the printer. Here's how the dump was made:

First the game program was loaded, run briefly, and stopped with RUN/STOP–RESTORE. Then we entered PRINT FRE (0). The resulting number tells how much free memory (in bytes) remains in the computer when the game is running. Remember, the machine language portion of VIC Dump must coexist in memory with the program you're dumping, so you have to make sure there's room for it. In this case, there was well over the 251 bytes necessary for VIC Dump.

Next we turned the computer off, then on again to be certain all memory was cleared out.

The third step was to follow the procedure outlined above. Load VIC Dump, enter **POKE 55,0:POKE 56,28:CLR** and then type RUN. The message SYS 6917 appears.

Fourth, we again loaded the game program. This automatically erases the VIC Dump BASIC loader, but remember, the machine language portion remains in memory. Even typing NEW does not wipe it out.

Next we had to determine where to embed the SYS command in the game program in order to dump the screen. To do this, we ran the game. When the screen was drawn, we pressed the RUN/STOP key. When you stop a program this way, the computer always tells you where the program was interrupted. Let's say the screen says BREAK IN 300. This would mean the program was interrupted at line number 300. Therefore, the SYS command should be inserted somewhere near this line. Assume the next line after 300 is 310. You could safely insert the command in between, like this:

```
305 SYS 6917
```

The sixth step is to make sure the printer is plugged in and switched on.

Finally, run the program. The screen sets up, the game starts, and then the program reaches the SYS command that was inserted. VIC Dump is activated and the printer goes to work. In about two minutes the screen dump is done.

With The Super Expander

The same steps would be followed, with a few differences, when using VIC Dump with the Super Expander cartridge. Remember to enter **GRAPHIC2:CLR:GRAPHIC0** after loading VIC Dump, and that the SYS command is SYS 3845 instead of 6917.

The Super Expander cartridge changes the top-of-memory pointer after each GRAPHIC statement, except GRAPHIC0. Fix this by using **GRAPHIC2:POKE 55,5:POKE 56,15:POKE 51,5:POKE 52,15** instead of just GRAPHIC2 in the program you want to dump. By making this change and embedding the SYS 3845 command, we produced the screen dumps of the Super Expander designs accompanying this article.

See program listing on page 101.

128 Autoboot

Steve Stiglich

These four programs allow you to create boot disks that automatically load and run a program when your 128 is turned on. You don't even have to type LOAD—it's all done for you. The "auto-run" disks can boot programs for either 128 mode or 64 mode from the 1541 or 1571 drive.

For many Commodore users, the idea of a *boot disk* is brand new. But if you've done much work with an Apple, IBM, or Atari, you know how convenient it is to insert a disk, turn on the system, and see a program automatically load and run. When a Commodore 128 is turned on (or when it's reset with SYS 65341), it checks for the presence of a disk drive. If the drive is turned on and contains a disk, the 128 checks track 1, sector 0, for an *autoboot sector.* Upon finding one, it follows the instructions there for loading and running a program.

The programs presented here allow you to write an autoboot sector to any disk. In addition, you can create a disk that makes the 128 go into 64 mode and automatically load and run your favorite program for the 64. You could make a *SpeedScript* boot disk, for example. All you'd have to do is turn on the drive, insert the disk, and power on the 128.

All four programs are written in BASIC, although some contain short machine language routines inside DATA statements. Program 1 writes an autoboot sector to a disk. The boot sector attempts to load and run a 128 program called "HI" so you should have a file by that name on the same disk. Program 2 is a menu program that gives you five choices. If you want this to be your boot program, save it to disk under the name "HI". Program 3 creates a machine language autorun 64 program file that causes another 64 program to load and run automatically after going into 64 mode. Program 4 uses the dynamic keyboard technique to load and run a BASIC or machine language program for the 64.

Special Typing Instructions

Programs 1, 2, and 3 should be typed in and saved from 128 mode. *You must not have a graphics area allocated when these programs are saved.* If you've been working with hi-res graphics, enter GRAPHIC CLR before saving the programs. The name given to Program 2 should be "HI" if you want the menu to automatically come up when you turn on the system (if you plan to boot any other 128 program, you can skip Program 2). It's of no importance which names you use for Program 1 or Program 3.

Program 4 is written for 64 mode, so you should enter GO 64 before beginning to type it in. *This program must be saved from 64 mode.* Be very careful with lines 10 and 20; type them exactly as listed. Save this program (from 64 mode) under the name "PROGRAM 4". It should be on the same disk as Programs 2 and 3.

Creating An Autoboot Sector For 128 Programs

Program 1, "Create 128 Boot Sector," is fairly straightforward. It writes an autoboot sector to track 1, sector 0, of a disk. Load Program 1, insert a disk into your 1541 or 1571, and type RUN.

It first prompts you for a screen color. Enter a number in the range 0–15. If you want the screen to be white, for example, enter 1. Next, you're asked for a border color. The default values (if you don't answer the questions) are a blue screen with a light gray border. The screen and border will take on these colors when the disk is booted.

When you've set the screen and border colors, Program 1 writes the autoboot sector to disk. If you reset your 128 by turning it off and then on, it will read the sector and try to load a file called "HI". The HI file can be any valid program saved from 128 mode. It will load and automatically run. If you should want to load and run a machine language program, use these two lines, substituting the filename and SYS address of your ML (machine language) program:

```
10 BLOAD "filename"
20 SYS xxxxx
```

DSAVE this short program as "HI" and when it boots, it will load the ML and start it running.

Using The Menu From Program 2

If you load and run Program 2, you'll see a menu with five options:

```
64 MODE—BASIC
64 MODE—RUN FILE
BOOT CP/M DISK
128 MODE—BASIC
128 MODE—RUN FILE
```

Use the cursor keys to select one of the options, then press RETURN. If you should choose 128 MODE—BASIC, the program

NEWs itself and exits to BASIC. 128 MODE—RUN FILE prompts you for the program name and then loads and runs that file.

If you opt for CP/M, it asks you to insert a CP/M disk. After doing so, press RETURN and CP/M will boot.

Choose 64 MODE—BASIC to go directly to 64 mode without loading a program. The second choice, 64 MODE—RUN FILE, leads into several questions. First, you're asked DOES FILE CONTAIN AUTORUN CODE (Y/N)? If you've used Program 3 to create an autorun file (see below), you should answer yes and provide a filename. Program 2 then BLOADs the autorun file and executes the GO 64 command.

If you answer no to the prompt, then there must be a copy of the "AUTORUN.C64" file on the disk (see the description of Program 3 below for instructions on how to create this file). The program loads AUTORUN.C64, and inserts the name of your program. Next you're asked "IS THIS A SELF-STARTING FILE (Y/N)?" If the 64 program to be loaded is in BASIC, answer yes. If not, you'll have to provide a SYS address. Finally, the 128 goes into 64 mode and runs the program you've requested.

A Memory-Based Cartridge For The 64?

We've already seen that the 128 checks for an autoboot disk sector when power is first turned on. But how does this program go into 64 mode and, in the process, cause the 64 to load and run a program? The answer can be found in the 64's own power-up routine. When you turn on a 64 (or GO 64 on the 128), the computer doesn't access the disk drive, but it *does* look for a cartridge. If it finds a certain sequence of letters and numbers at location 32768 (hexadecimal $8000), it does not enable BASIC, but instead surrenders control to the program in the cartridge.

All three modes of the 128 (128, 64, and CP/M) share certain areas of memory. So, if we write a cartridge-emulator, it can be BLOADed into location 32768 (in 128 mode). With that special program in place, the GO 64 command makes the computer turn into a 64 and begin the reset routine. As 64 mode is initializing itself, it finds something that looks like a cartridge at 32768. The memory-based cartridge tells it to load and run a program from disk.

In order to get this to work, we have to create the cartridge-emulator with Programs 3 and 4.

First enter Program 4 (remember, *this must be typed and saved from 64 mode*). Let's say you call it "PROGRAM 4". Now turn the 128 off and back on, and enter Program 3 (from 128 mode). Now we can begin.

Run Program 3. Answer the first prompt with "PROGRAM 4" (which must be on the disk currently in the drive). The disk drive light will turn on while the program is read into memory. When it's finished, it will ask for a filename. Answer "AUTORUN.C64". It will create the generic cartridge emulator used by Program 2. If this emulator is on a disk, Program 2 will be able to put the 128 into 64 mode and run any BASIC or ML program.

You can also generate a cartridge emulator for running a specific program. Let's say you want to create an autorun file for a game called SPACEGAME (saved as a BASIC program from 64 mode). Load and run Program 3. When it asks for the program name, answer "SPACEGAME". After reading the file, it will ask for a filename. Call it something like "SPACE.BOOT".

With a specific boot program in place, you can go into 64 mode and run it with the following sequence of events:

1. Insert the disk in the drive and turn on your 128.

2. The boot sector (which was created by Program 1) is loaded. It, in turn, loads the "HI" program (Program 2, saved under the name HI) from the disk.

3. Program 2 presents you with the menu of choices. Cursor down to 64 MODE—RUN PROGRAM and press RETURN.

4. Answer yes to DOES FILE CONTAIN AUTORUN CODE? and enter SPACE.BOOT as the name of the program. The computer then goes into 64 mode. The boot program, acting like a cartridge, then loads and runs the 64 program SPACEGAME.

Bypassing The Menu

There's one final option. Let's say you want to set up a boot disk that goes into 64 mode and loads (and runs) *SpeedScript*. You don't need Program 2, because you don't want the menu to appear—you just want *SpeedScript* to load and run. Follow these steps:

1. Load *SpeedScript* (from 64 mode) and save it to a freshly formatted disk.

2. Load Program 4 (again from 64 mode) and change lines 10–20. The first line should say **A$="SPEEDSCRIPT"** and line 20 should read **B$="RUN:"**. (If this were a machine language program stored at 49152, you would substitute SYS 49152 in line 20). Save this under the name "SSLOADER" as the second program on the disk containing *SpeedScript*.

3. Go into 128 mode by pressing the reset switch, or turning it off and then back on. Load Program 3 and insert the disk containing the two programs. Run Program 3 and answer SSLOADER for the program name. Then answer SS.BOOT for the name of the boot program. There are now three programs on the disk.

4. While still in 128 mode, type NEW. Enter this one-line program:

```
10 BLOAD"SS.BOOT":GO 64
```

Save this to the disk as "HI"—the fourth program on the disk.

5. Finally, load Program 1. Switch disks, inserting the dedicated *SpeedScript* disk. Run the program and an autoboot sector will be created. Now you have a disk which contains four programs and a boot sector.

Turn everything off. Turn on the disk drive and insert the *SpeedScript* disk. Turn on the 128. You don't need to do anything else. The boot sector loads the program called "HI". It loads the cartridge emulator and goes into 64 mode. The code at 32768 makes the 64 think a cartridge is in place, so SSLOADER is run. It, in turn, loads and runs *SpeedScript*.

It may seem like a lot of work, but the results are worth it. To load and run a 64 program, just turn on your 128. Everything is handled by the boot sector (and the related files).

See program listings on page 108.

Clavier 64

Peter Sribniak

This small but efficient three-voice music player will be useful to music students or those interested in composing on the 64. It uses machine language routines for accuracy at fast tempos. Another valuable feature for serious music programmers is the large amount of memory available—over 35K of music data can be handled easily.

All Commodore 64 music and sound is handled by a computer chip called the Sound Interface Device, usually referred to as the SID chip. Its three independent voices can combine to provide polyphonic (multi-voice) harmonies. At any time, you can do one of three things to a voice: 1) stop the previous note to begin a new one, 2) silence the voice, or 3) allow the sound to continue as it is (active or silent) by doing nothing.

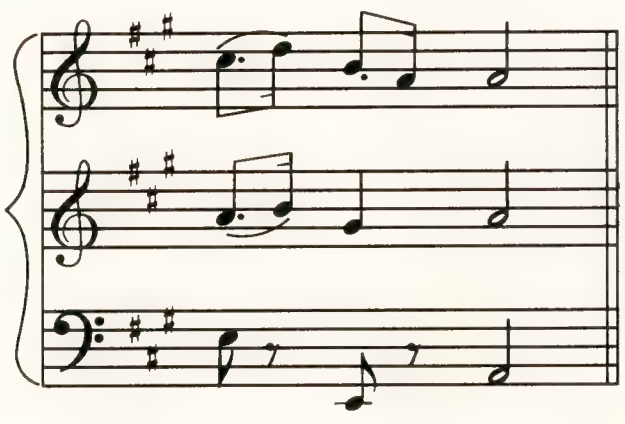
To play a single note requires several POKEs to SID chip registers, and to play a chord requires many more POKEs. Writing a song with polyphonic harmony can be a daunting chore. "Clavier 64" lets you concentrate on composing the music, freeing you from the tedium of looking up hundreds of POKEs.

You begin composing a song by breaking it into a series of *events*. An event is the shortest time period in the melody, an eighth note, a sixteenth, and so on. At the beginning of each event, the three voices are changed, silenced, or left alone. If you chose a sixteenth note as the smallest time period, for example, you would allow four events to pass to play a quarter note. Eight events would be a half note, sixteen a whole note, and so on. Clavier 64 has the capability of changing a note's pitch without cutting off the previous note. This produces an excellent legato effect.

The necessity of rapidly turning each voice on or off in succession could produce problems if you try to play rapid music using BASIC. The fast machine language routines in Clavier 64 solve this problem by greatly reducing the time required to decode data successively for each voice. The result is virtually instantaneous gating of all three voices.

Notes Into Data

The figure below shows a brief musical excerpt which will illustrate most of the coding principles of Clavier 64.

The first step is to determine the basic unit, or event, of the music since this unit will be in effect for the duration of the composition. The unit is usually the shortest note value in the composition. (In the figure above, that unit is a sixteenth note.) To make sure, check to see

that every note in the composition is a multiple of the basic event. If a note isn't, see the section below on complex rhythms.

Having established the unit event, use the Clavier 64 Note Values table to look up the value for each note. Following each note is the frequency (Hz) and two codes. Choose the higher or lower code value according to these rules:

1. The higher value is used if the note is tied to the note in the same voice in the next event.

2. The lower value is used if the note is detached from the note in the same voice in the next event, or if the note is followed by a rest.

3. A silence or rest in any voice always has a value of 192.

4. The final event contains either 192 or values less than 64.

Let's look at the DATA statements corresponding to the musical excerpt in the figure above. These are found in lines 350–500 of the program.

```
350 DATA 102, 98, 81
360 DATA 102, 98, 17
370 DATA 102, 98, 192
380 DATA 39, 36, 192
390 DATA 100, 97, 69
400 DATA 100, 97, 5
410 DATA 36, 97, 192
420 DATA 34, 33, 192
430 DATA 98, 98, 74
440 DATA 98, 98, 74
450 DATA 98, 98, 74
460 DATA 98, 98, 74
470 DATA 98, 98, 74
480 DATA 98, 98, 74
490 DATA 98, 98, 74
500 DATA 34, 34, 10
```

Each line is one event, while each value in the line corresponds to one voice. Thus you can consider the data values as a matrix with three columns representing the three voices and any number of rows representing successive events in time.

The first data line must be numbered starting at 350 for any composition using Clavier 64. Using the matrix concept, we'll start with the first note of the first voice (the top staff in the figure) and continue down the first column of successive rows with the first voice to the end of the bar (line 500). Then we'll repeat the process for each of the other two voices (columns two and three).

The first note in the top voice, a dotted eighth C#, is three events long, equivalent to three sixteenth C#'s tied together. Since this note is tied to the following note, the higher C# value is used for all three events. Therefore the first data value in each of the first three events (lines 350–370) is 102. The sixteenth D which follows the C# is detached from the note that follows (a B). Therefore the first value in the fourth event (line 380) is 39. The following dotted eighth B is detached from the next note (an A). So the first two events of its duration will use the higher value while the third uses the lower value.

Lines 390 and 400 have 100 as their first value while line 410 has 36. The detached A sixteenth note is one event and is represented by the 34 in line 420. The final A half note is 8 events long. Since it ends the music, the first seven are high values and the last event is low. Therefore lines 430–490 have 98 and line 500 has 34 as the first value.

Proceeding to voice two (the middle staff), we go back to the first data statement (line 350) and move downward filling in the second value of each data statement. The first two notes of the second voice have the same rhythm and articulation as the first voice, only differing in pitch. Using the same reasoning, high values for A (three events at 98) and one low value for B (36) are in the second position of lines 350–380. Then follows a detached G# quarter note. This is equivalent to four tied sixteenth notes, the last being the low value because the A is detached. Therefore lines 390–420 have 97, 97, 97, and 33, respectively. The final A of the second voice is identical to the first voice and is coded the same way.

The third voice opens with an E eighth note followed by a rest. The first event uses the high value for the E and the second uses the low one, hence 81 and 17 in the third position of lines 350 and 360, respectively. The eighth rest is coded as 192 in the following two events in the third voice (position three in lines 370 and 380). The eighth E that follows is coded again, as a high E value followed by a low one (69 and 5 in lines 390 and 400). The second eighth rest is 192 in lines 410 and 420. The final A half note is eight events long with the first seven values high and the last low. The reasoning is the same as for the final A in voices 1 and 2.

Complex Rhythms

Complex rhythms are those which contain note values which are not simple multiples of the shortest note, rhythms containing both normal and triplet eighth notes, for example. (A normal eighth is not a multiple of a triplet eighth). The event is calculated using the lowest common denominator (LCD)—the triplet eighth is 1/3 of a beat while the normal eighth is 1/2 beat. The LCD—1/6 of a beat—is the unit event. A normal eighth therefore is three events, a triplet eighth two events, a quarter six events, and so on.

Using The Program

Clavier 64 consists of two parts. The first part (lines 10–220) is a BASIC loader for the frequencies and routines, while the second part (230–340) sets up the SID chip, reads the code, and calls the machine language routines.

Modifications and DATA statement editing are done by listing the appropriate DATA statements and using the screen editor as in any other BASIC program. As mentioned earlier, over 35K of data can be handled with no problem (approximately 17K of data equals 1,000 events and if you're using sixteenth notes as the event period, 17K is equivalent to about 64 measures). The SID values have been chosen to provide an "all purpose" sound so that usually only the tempo would need adjusting. This is done by changing the value of V in line 300. Increasing the value of V decreases the tempo and vice versa. ADSR and waveform values can easily be changed by substituting new values in the appropriate POKE commands in lines 240–250.

When the composition is to your liking, put in your own DATA statements from line 350 on, with the last being DATA 0,0,0 and save the program with these DATA statements.

Advanced BASIC programmers can easily modify the program to read more than three values for each event. These additional values could then be used to POKE new

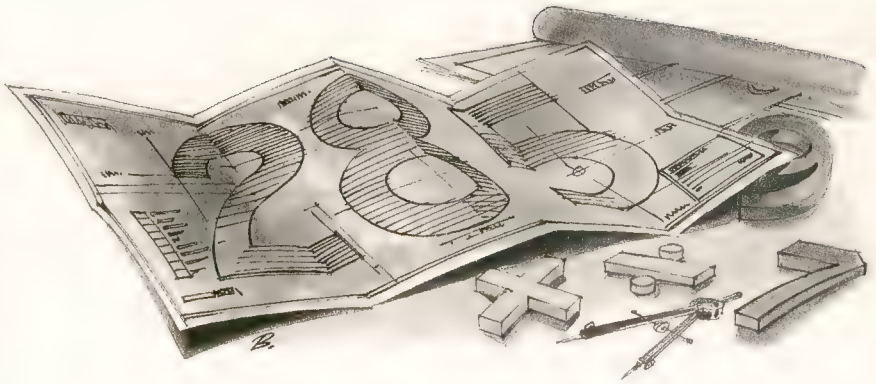
ADSR or waveform values or to vary the duration of the main loop to produce swing, rubato, and various other tempos.

See program listing on page 102.

Clavier 64 Note Values

Note	Frequency (HZ)	Code	
C	65	1	65
C#	69	2	61
D	73	3	67
D#	78	4	68
E	82	5	69
F	87	6	70
F#	93	7	71
G	98	8	72
G#	104	9	73
A	110	10	74
A#	117	11	75
B	123	12	76
C	131	13	77
C#	139	14	78
D	147	15	79
D#	157	16	80
E	165	17	81
F	175	18	82
F#	185	19	83
G	196	20	84
G#	208	21	85
A	220	22	86
A#	233	23	87
B	246	24	88
*C	262	25	89
C#	277	26	90
D	294	27	91
D#	311	28	92
E	330	29	93
F	349	30	94
F#	370	31	95
G	392	32	96
G#	415	33	97
A	440	34	98
A#	466	35	99
B	494	36	100
C	523	37	101
C#	554	38	102
D	587	39	103
D#	622	40	104
E	659	41	105
F	698	42	106
F#	740	43	107
G	784	44	108
G#	831	45	109
A	880	46	110
A#	932	47	111
B	988	48	112
C	1047	49	113
C#	1109	50	114
D	1175	51	115
D#	1246	52	116
E	1319	53	117
F	1397	54	118
F#	1480	55	119
G	1568	56	120
G#	1661	57	121
A	1760	58	122
A#	1865	59	123
B	1976	60	124
C	2093	61	125

*middle C



Number Construction Kit

Gerald W. Rightmer

You've got the tools, materials, and a goal in this construction project. All you have to do is think hard and work fast. For children, an excellent program for practicing math skills; for adults, a real brain teaser. Designed for the Commodore 64, Plus/4, and 16.

Your bid has just been accepted for a new construction project—to build a three-digit number between 100 and 999. Fortunately you have your number construction kit, which includes everything you need for the task. Your tools are the four basic arithmetic operators: +, −, *, and /. Your building materials are single digit integers, three, four, or five of them, depending on the level of play you choose. And, as with all construction projects, there is a deadline: one, two, or three minutes, depending on your level of expertise.

Getting Started

"Number Construction Kit" is written entirely in BASIC for the Commodore 64. Type in the program and save a copy. If you have a Plus/4 or Commodore 16, substitute this line:

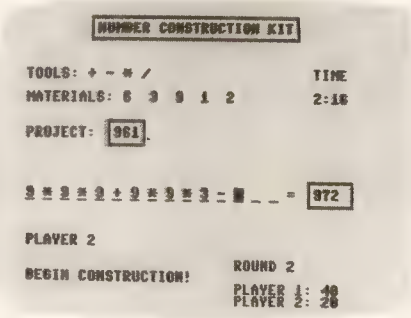
```
QF 20 COLOR0,1,1:COLOR4,1,1:CC
      =202:Q=205:Y=239:C0=2608
      :SC=3670:B$=CHR$(159)
```

To play, load the program and type RUN. First, you're asked for the number of players. Press 1 or 2. Then you're asked to choose one of three difficulty levels: 1. Beginner,

2. Intermediate, or 3. Advanced. Press the number key which corresponds to your choice. At the beginner level, you're given five numbers for materials and three minutes to complete the construction project. At the intermediate level, there are four numbers to build with and two minutes to finish. And, if you're up to it, the advanced level offers only one minute and three numbers to work with.

After selecting the number of players and a difficulty level, you're ready to begin. The project total (your goal) and materials (the numbers you're given to work with) are presented and you're prompted to press any key to begin. As soon as the game begins, the timer starts counting down. First select one of the numbers from the materials listed. Then choose one of the operators: the plus or minus sign (on the top row of the keyboard), the multiplication sign (on the second row beneath the minus sign), or the division sign (at the bottom row next to the right SHIFT key).

Begin building toward your project goal without hesitation. If you reach the project goal before time runs out, press RETURN. Each game consists of five rounds. In the two-player game, one round consists of one turn for each player. After five rounds, the game ends, and you're asked if you'd like to play again. At this point, you can change the number of players and the difficulty level.



This player is about to successfully complete a "project."

Staying In Bounds

Like any construction project, there are constraints. First, there are only 15 spaces with which to work. This means that you can use only eight numbers and seven operators to complete the project. You're allowed to move across the computation line using the cursor keys, and change numbers or operators simply by typing over the existing characters. A running total is displayed to the right of the equation, allowing you to instantly monitor your progress. Since the target number is positive and greater than 100, the program does not allow numbers less than 0 in the target number. Also, numbers greater than 9,999 cannot be created during the construction process. Error messages will appear, and the game will pause if the running total is greater than 999 or less than 0.

Scoring is based on how close you are to the target, the difficulty level, and how quickly you respond. If your total at the point when time expires is greater than 200 from the proposed project total, then no score is awarded for the round. A round is terminated either by the clock or by pressing the RETURN key.

The program randomly generates numbers for the project goal and materials, excluding duplicates and zeros. The only keys that work are the designated materials (numbers) keys, the four operators, left and right cursor keys, DELete, and RETURN. The DELete key deletes only from the end of the line and removes only the character under the cursor. This means that no gaps can be created in the middle of a computation line (this would result in a meaningless arithmetic expression).

Number Construction Kit is a challenge to any age, and it can be an entertaining way to reinforce basic arithmetic skills in children. Since immediate feedback is given throughout the game, a child can learn much by trial and error.

For those simply looking to win the game, a few strategy tips might be helpful. The first step is to study the project number and the materials before pressing a key to start construction. For larger, more difficult numbers, it's usually easier to get within range of the project as fast as possible and to fine tune your answer with the remaining time and space. Remember, the materials may be used as often as necessary—you have an unlimited supply.

See program listing on page 105.

All programs listed in this magazine are available on the GAZETTE Disk. See elsewhere in this issue for details.

COMPUTE!'s Gazette is looking for utilities, games, applications educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it, on tape or disk to:

Submissions Reviewer
COMPUTE! Publications
P.O. Box 5406
Greensboro, NC 27403

Please enclose an SASE if you wish to have the materials returned.
Articles are reviewed within four weeks of submission.

COMPUTE! Books Announces

OUR FIRST EVER

INVENTORY REDUCTION *Sale*

As computers come and go in industry popularity, we try our best to maintain a flow of excellent books for readers and users of the most popular personal computers. You'd be the first to agree that, simply because a particular computer is no longer produced, information on it is no less important to you. But we've found that when some computers lose mass appeal, or are no longer at the top of the current best-seller list, many book stores no longer wish to stock books on them.

These books become arguably more valuable to those who need them . . . those who never got around to buying them . . . or those who have bought their personal computer second-hand, but now can't find books about it.

This sale is for you. It mixes the best of our backlist—from machine-specific to topical titles that never quite caught on—and gives you significant savings on dozens of COMPUTE! titles. Some quantities are very limited, so send in your order soon. Credit card or check with order only. Or call our toll free number: 1-800-346-6767 (in NY 212-887-8525).

Order any three from Group A for $24.95 (an initial savings of at least 30 percent), and receive up to three from Group B for $3.00 each. (A potential *total savings of over $55.00!*) All orders add $2.00 shipping and handling per book up to 5 books. Over 5 books, add $5.00 per order.

Group A (Three for $24.95)

First Book of Atari Graphics
Second Book of Atari Graphics

Commodore 64 Games for Kids
All About the Commodore 64, Vol. 1
First Book of Commodore 64 Sound and Graphics
Reference Guide to Commodore 64 Graphics

Home Computer Wars
Personal Telecomputing
BASIC Programs for Small Computers
Computing Together

Programmer's Reference Guide to the TI-99/4A
TI Games for Kids
33 Programs for the TI-99/4A
Guide to TI-99/4A Sound and Graphics

First Book of VIC
Second Book of VIC
Third Book of VIC
VIC Games for Kids
Programming the VIC

Arcade Games on the Timex/Sinclair
Programmer's Reference Guide to the Color Computer

Group B (Up to three for $3.00 each)

First Book of Atari

First Book of Commodore 64
First Book of Commodore 64 Games
Commodore Peripherals: A User's Guide

First Book of Robots
Home Energy Applications
Beginners Guide to Buying a Personal Computer

First Book of TI Games
Extended BASIC Home Applications on the TI-99/4A
Arcade Games on the TI-99/4A

First Book of VIC Games
Arcade Games on the VIC
Second Book of VIC Games

All sales final. No returns. All are new books in good condition.

Special offer through March 15. Order four books for $34.95 from Group A** and choose up to *six* additional titles from Group B for only $3.00 each.

**substantial savings . . . less than $8.75 each for values up to $24.95.

SAVE 75% or more on selected titles

$1.00 shipping/handling per book for 1–5 books. Over 5 books, $5.00 per order.

simple answers to common questions

Tom R. Halfhill, Staff Editor

Each month, COMPUTE!'s GAZETTE *tackles some questions commonly asked by Commodore users. If you have a question you'd like to see answered here, send it to this column, c/o* COMPUTE!'s GAZETTE, *P.O. Box 5406, Greensboro, NC 27403.*

Q. I recently purchased a piece of software that would not load or run properly on my Commodore 64 and 1541 disk drive, but it ran fine on the store's computer system. The dealer said my problem is a misaligned disk drive. I am skeptical, since all of my other software runs properly and the performance test on the 1541 Demo Disk does not indicate any problems. What exactly is disk drive misalignment? What causes it and how do I fix it? If the problem exists, shouldn't the performance test program identify it?

A. Since the commercial software disk loads and runs on the dealer's disk drive but not yours, it's probably true that your drive is misaligned. This can be true even though your drive passes the performance test program on the 1541 Demo Disk with flying colors, and even though your own disks load without trouble.

Why? The performance test doesn't measure your drive's alignment relative to other drives; it only measures how well your drive maintains alignment relative to itself. Similarly, your own disks presumably were initialized on your drive; a misaligned disk drive will produce misaligned disks. The drive may be perfectly capable of reading its own disks, but not anyone else's. Conversely, other people's drives may not be able to read *your* disks. And since there's a degree of tolerance for misalignment in both disks and disk drives, certain disks will load while others won't. This can even change over time: You may find that disks which loaded fine a few months ago suddenly don't work today. Also, commercial disks sometimes have less tolerance for misalignment because of their copy-protection schemes.

Misalignment means that the drive's read/write head is having trouble locating tracks on the disk. A track is an invisible ring of data recorded on the disk's magnetic surface. Data is recorded on a Commodore 1541 disk in 40 tracks of concentric rings. You can get a rough idea of how narrow these tracks are by examining the access window on a floppy disk; all 40 tracks must be squeezed into the space where the magnetic surface is visible.

A very precise electric motor slides the read/write head along guide rails over this access window. (If you listen closely in a quiet room, you can hear the head moving from track to track, especially when formatting a blank disk.) When the correct track is located, the head stops and begins reading or writing. A misaligned head has difficulty finding the correct track, so errors result. Often this happens when the head tries to access an innermost or outermost track which is beyond its range of movement.

Read/write heads can become misaligned due to wear or rough handling, particularly during shipment. You can get test programs to detect this misalignment and help you (or a repair person) realign the head. It's a good idea to test your drive periodically even if it's not having problems, because a drive which slowly slips out of alignment might have trouble reading its own disks after it is readjusted. Several of these test programs are advertised and have been reviewed in COMPUTE!'s GAZETTE. If you aren't handy with a screwdriver, we recommend taking your drive to a Commodore dealer for alignment.

Q. I have a Commodore 64 and an Amdek Color 300 monitor with separate inputs for chroma/luma and NTSC. I was told to use the NTSC input by the salesman and the cable he sold me only works with this input. I have seen references to chroma/luma inputs in your column and would like to know if using these will improve the resolution. Also, what kind of cable would I need, and where could I purchase it?

A. Hooking up your 64 to the separate chroma/luma inputs will indeed yield a much sharper picture with considerably less color smearing. These are the same separated video inputs found on the rear of the Commodore 1701/1702/1902 monitors. The improvement can be startling.

It's not unusual that your salesman was unaware of this. Not many non-Commodore monitors even have separate chroma/luma inputs, because only a few computers have chroma/luma outputs: the Commodore 64, 128, Plus/4, and 16; and the Atari 800 and 130XE. Most computers have only regular composite video output, sometimes called NTSC (because the standard was established by the National Television Standards Committee).

The cable you need should be available from a Commodore dealer. It comes packed with 1702/1902 monitors and is available separately. You might also have some luck at electronics parts stores. Ask for an "octopus cable" with a DIN plug at one end (some 64s have five-pin DINs while others have eight-pin DINs) and four phono plugs at the other end. You may have to experiment to discover which two of these four phono plugs match the chroma/luma inputs on your monitor, but don't worry—you can't cause any damage by momentarily plugging them into the wrong jacks.

news & products

BASIC Toolkit For 64

Epyx has introduced the *Programmer's BASIC Toolkit*, a programming utility package which adds more than 100 new BASIC commands for assembly language operations with the Commodore 64 and 128 (in 64 mode). The program uses Macintosh-style sprite and font editors, and boosts the Commodore operating system with such features as a directory listing command, easy to use disk command syntax, and a load/save function for graphics, sprites, and character sets. The *BASIC Toolkit* also allows you to print disk catalogs, text files, and program listings easily in BASIC.

The program, which includes a built-in fast-load feature, is priced between $34.95 and $44.95.

Epyx, Inc., 1043 Kiel Court, Sunnyvale, CA 94089.

Circle Reader Service Number 241.

Low-Priced Commodore Games

The Last V8 and *Hero Of The Golden Talisman* are two of the newest releases in Mastertronic International's line of low-priced game software for the Commodore 64 and 128 (in 64 mode). The two new disk-based games sell for $9.95 each, and are among more than two-dozen inexpensive arcade-style or strategy games offered by the company at that price. *Golden Talisman* is an action adventure game set in an intricate labyrinth. *The Last V8* is an arcade-style car race against time that includes voice synthesis and 360-degree scrolling.

Mastertronic International, Inc., 7311B Grove Road, Frederick, MD 21701.

Circle Reader Service Number 242.

1541 Controller

Micro Fabrication Systems has released 1541 Control, a hardware controller for the 1541 disk drive. The unit, which mounts on top of the drive, gives you the ability to change the drive's device number, to double the disk storage with a flip of a switch, and to reset the computer or drive independently of each other. The entire system can also be reset. An illustrated manual accompanies the package.

Suggested retail price is $34.95.

Micro Fabrication Systems, P.O. Box 1114, Delaware, OH 43015.

Circle Reader Service Number 243.

The 1541 Control disk drive controller.

Homework Helpers

Spinnaker Software has released two new educational programs for students in grades 7 through 12. In *Homework Helper: Math Word Problems*, a tutorial section leads students through a step-by-step process to build a correct equation. The Solver Section then provides practice in solving actual homework problems through the use of prompts and the program's built-in calculator.

Essays and book reports are the focus of *Homework Helper: Writing*. Using a series of prompts and questions supplemented by help files, the program guides the student through three stages of writing: forming ideas, organizing the ideas into an outline, and writing the text from the outline. The program includes full word processing, editing, and printing capabilities.

Homework Helpers are available for the Commodore 64/128 for $32.95.

Spinnaker Software, One Kendall Square, Cambridge, MA 02139.

Circle Reader Service Number 244.

Superman: The Game

It's up to Superman to save Metropolis from the evil forces of D.C. Comics's villain, Darkseid, in First Star Software's new release *Superman: The Game*. Players can choose to control either Superman or Darkseid, and can play against one another or against the computer. As Darkseid tries to wrest the secret of the Anti-Life formula from the citizens, Superman struggles to foil him using his heat vision, super breath, and his powers of flight and strength.

Several playing screens are included, among them mazes and arcade-style games requiring both strategy and fast action. There are three levels of play; the easier levels have fewer citizens to save. *Superman: The Game* is available for the Commodore 64 and 128 at a list price of $29.95.

First Star Software, 18 East 41st St., New York, NY 10017.

Circle Reader Service Number 245.

High-Performance Flight Simulator

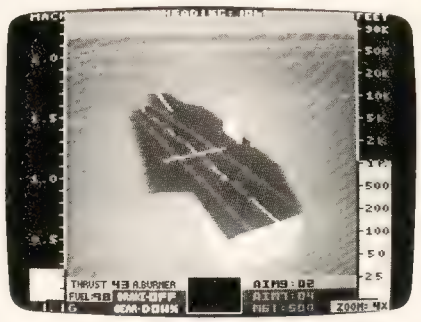
SubLOGIC Corporation has introduced a Commodore 64/128 version of *JET*, a program that simulates the flight of two supersonic jet fighters: a land-based F-16 Fighting Falcon or a carrier-based F-18 Hornet.

JET tests your pilot's skills under a variety of land/sea strike or dogfight combat conditions. It also offers a free-flight non-combat mode. Using the program's "Heads Up Display," you can monitor instruments and environment simultaneously. The display also provides a full-screen view out the window. Either aircraft can be fitted with a variety of weapon types (air-to-air missiles, AGM missiles, or smart bombs) depending on the mission selected.

JET is compatible with all subLOGIC Scenery Disks, and retails for $39.95.

SubLOGIC Corporation, 713 Edgebrook Dr., Champaign, IL 61820.

Circle Reader Service Number 246.



Cockpit view of an F-18 on carrier-landing approach in subLOGIC's JET *for the Commodore 64 and 128.*

bug-swatter

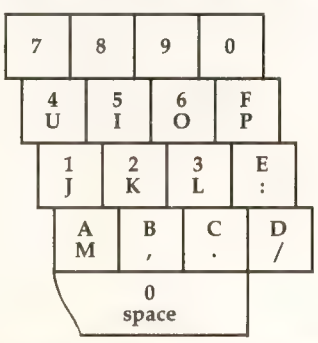
Modifications And Corrections

• The "New Automatic Proofreader" (February) will not work as listed on a Plus/4, 16, or 128 (in 128 mode). In lines 40 and 50, the statement **GRAPHIC CLR** should replace **WAIT CLR**. GRAPHIC CLR is necessary to eliminate any graphics area that may have been allocated prior to loading the Proofreader, to ensure that the ML portion of the program is stored in the correct area of memory. GRAPHIC is a command available in BASIC 3.5 and 7.0, but not in BASIC 2.0. The program on the GAZETTE Disk was correct, but the listing was made on a Commodore 64, which cannot properly interpret the token for the GRAPHIC command and substituted the WAIT command in its place. The listing has been corrected in this issue. We regret any inconvenience this may have caused our readers.

• Many readers have written to say that although the new version of "MLX" (first published in January 1986) requires fewer keystrokes, it takes longer to enter a program because the keys 0–9 and A–F are not centrally located. To create a numeric keypad, add the following lines:

```
485 A=-(A$="M")-2*(A$=",")-3*(
    A$=".")-4*(A$="/")-5*(A$=
    "J")-6*(A$="K")
486 A=A-7*(A$="L")-8*(A$=":")-
    9*(A$="U")-10*(A$="I")-11
    *(A$="O")-12*(A$="P")
487 A=A-13*(A$=S$):IF A THEN A
    $=MID$("ABCD123E456F0",A,
    1):GOTO 540
```

Numeric Keypad For MLX



In addition, readers who have encountered an error in line 830 should check the spacing. There must be a space between **ST** and **AND** in that line. If the space is left out, the BASIC interpreter is confused by the presence of the embedded keyword TAN.

• A similar caveat applies to line 350 of Program 1, Dictionary Manager, from "SpeedCheck" (December 1985). There must be a space between **ST** and **OR**. If the space is left out, the 64 sees the keyword TO in the line.

• Spacing is also very important in line 340 of the 64 version of "Banners" (December 1985). We received several program listings from readers who did not type the space between quotation marks in the statement **PR$=PR$+" "**. Without that space, the letters printed out will look like they collapsed. If the crossbar on a capital H has fallen to the baseline making it resemble a capital U, the problem is most likely in line 340. If problems persist, carefully check lines 280–290 and make sure you did not substitute a less-than sign for a left parenthesis or a B for an 8.

• Reader John F. Howard has discovered a bug in the routine that reads the disk directory in Program 1, File Protector, from "Soft Write Protector For Disks" (December 1985). If a program name containing exactly 16 characters is found, no more files from that sector will be listed to the screen. To correct this, change line 270 from **IF C<17** to **IF C<16**. He also notes that using this utility to protect a file does not hamper the operation of save-with-replace command. Also, if the program skips over a number or two, it's bypassing a directory entry of a previously scratched file. You'll sometimes see less than eight file names per sector.

COMMON STOCK ANALYSIS WITH YOUR COMPUTER
WALLSTREET MICROSCOPE

Available for: Commodore-64;
Apple II+, II E, II C; IBM and Compatibles

- Stocks Judged by 10 Criteria
- 5 By Price (Cap Gains Potential)
- 5 By Financial Stability (Safety)
- Criteria Values May Be Set By User

Eight Computer Programs
Thorough Documentation
Comes Complete With
1500 Company Data Base
$135.00

(Updates Available By Subscription)

- Search Capabailities
- Market Averages
- Single or Batch Processing
- Graphics

DEMONSTRATION DISK—$10
($13—C.O.D.)
Order Demo Direct or From Your Dealer.
(Dealer Inquiries Invited)

"As a Powerful Financial Planning Tool, Wallstreet Microscope is Top—Notch . . . Wallstreet Microscope Gives You Your Money's Worth And More—As a Reliable, Computerized Stock Manager and Forecaster."

(The Book of Commodore 64 Software 1985)

WALLSTREET CORP.
Call: (402) 390-3372 (24 Hrs.) for C.O.D.
Write: 1438 South 76th Street
Omaha, NE 68124

FACTORY AUTHORIZED
COMMODORE
REPAIR CENTER
1-800-772-7289
IN ILLINOIS (312) 879-2888

C64 Repair 39.95*
1541 Repair 79.95*
1541 Alignment only 29.95*
Power Supplies . 32.95
Commodore Parts . CALL

* Includes parts, labor & UPS return shipping. Air Freight add $10.00.

CALL BEFORE SHIPPING

VISA, MASTER or MONEY ORDER
SERIAL NUMBERS REQUIRED

24-48 HRS TURN AROUND

TEKTONICS PLUS, INC.
150 HOUSTON ST. — STE. 308
BATAVIA, IL 60510

CLIP AND SAVE

MLX Machine Language Editor For The Commodore 64

Ottis Cowper
Technical Editor

"MLX" is a labor-saving utility that will help you enter machine language program listings without error. MLX is required to enter all Commodore 64 machine language programs published in COMPUTE!'s GAZETTE. This version of MLX was first published in the January 1986 issue; it cannot be used to enter MLX programs published prior to that date, nor can earlier versions of MLX be used to enter the listings in this issue.

Type in and save a copy of MLX. You'll need it for all future machine language programs in COMPUTE!'s GAZETTE, as well as machine language (ML) programs in our companion magazine, COMPUTE!, and COMPUTE! books. When you're ready to enter an ML program, load and run MLX. It asks you for a starting and ending address. These addresses appear in the article accompanying the MLX-format program listing you're typing. If you're unfamiliar with ML, the addresses (and all other values you enter in MLX) may appear strange. Instead of the usual decimal numbers you're accustomed to, these numbers are in *hexadecimal*—a base 16 numbering system commonly used by ML programmers. Hexadecimal—hex for short—includes the numerals 0–9 and the letters A–F. But even if you know nothing about ML or hex, you should have no trouble using MLX.

After you enter the starting and ending addresses, MLX offers the option of clearing the workspace. The data you enter with MLX is kept in a special reserved area of memory; clearing this workspace area fills the reserved area with zeros, which will make it easier to find where you left off typing if you enter the listing in several sessions. Choose this option if you're starting to enter a new listing. If you're continuing a listing that's partially typed from a previous session there's no point in clearing the workspace, since the data you load in will fill the area with whatever values were in workspace memory at the time of the last Save.

At this point, MLX presents a menu of commands:

```
Enter data
Display data
Load data
Save file
Quit
```

Press the corresponding key to select a menu option. These commands are available only while the menu is displayed. You can get back to the menu from most options by pressing RETURN.

Entering A Listing

To begin entering data, press E. You'll be asked for the address at which you wish to begin. (If you pressed E by mistake, you can return to the command menu by pressing RETURN.) When you begin typing a listing, enter the starting address here. If you're typing in a long listing in several sessions, you should enter the address where you left off typing at the end of the previous session. In any case, make sure the address you enter corresponds to the address of a line in the MLX listing. Otherwise, you'll be unable to enter the data correctly.

After you enter the address, you'll see that address appear as a prompt with a nonblinking cursor. Now you're ready to enter data. To help prevent typing mistakes, only a few keys are active, so you may have to unlearn some habits. MLX listings consist of nine columns of two-digit numbers—eight bytes of data and a checksum. You *do not* type spaces between the columns; the new MLX automatically inserts these for you. Nor do you press RETURN after typing the last number in a line; MLX automatically enters and checks the line after you type the last digit. The only keys needed for data entry are 0–9 and A–F. Pressing most of the other keys produces a warning buzz.

To correct typing mistakes before finishing a line, use the INST/DEL key to delete the character to the left of the cursor. (The cursor-left key also deletes.) If you mess up a line badly, press CLR/HOME to start the line over. The RETURN key is also active, but only *before* any data is typed on a line. Pressing RETURN at this point returns you to the command menu. After you type a character, MLX disables RETURN until the cursor returns to the start of a line. Remember, you can press CLR/HOME to quickly get to a line number prompt.

Beep Or Buzz?

After you type the last digit in a line, MLX calculates a checksum from the line number and the first eight columns of data, then compares it with the value in the ninth column. The formula (found in lines 370–390 of the MLX program) catches almost every conceivable typing error, including the transposition of numbers. If the values match, you'll hear a pleasant beep, the data is added to the workspace area, and the prompt for the next line of data appears (unless the line just entered was the last line of the listing—in which case you'll automatically advance to the Save option). But if MLX detects a typing error, you'll hear a low buzz and see an error message. Then MLX redisplays the line for editing.

To edit a line, move the cursor left and right using the cursor keys. (The INST/DEL key now works as an alternative cursor-left key.) You cannot move left beyond the first character in the line. If you try to move beyond the rightmost character, you'll reenter the line. To make corrections in a mistyped line, compare the line on the screen with the one printed in the listing, then move the cursor to the mistake and type the correct key. During editing, RETURN is active; pressing it tells MLX to recheck the line. You can press the CLR/HOME key to clear the entire line if you want to start from scratch, or if you want to get to a line number prompt to use RETURN to get back to the menu.

Other MLX Functions

The Display data option lets you review your work. When you select D, you'll be asked for a starting address. (As with the other menu options, pressing RETURN at this point takes you back to the command menu.) Make sure the address corresponds to a line from the listing. You can pause the scrolling display by pressing the space bar. (MLX finishes printing the current line before halting.) To resume scrolling, press the space bar again. The display continues to scroll until the ending address is reached, then the menu reappears. To break out of the display and return to the menu before the ending address is reached, press RETURN. A quick way to check your typing is to compare the reverse video checksums on the screen with the data in the rightmost column of the printed listing. If the values match, you can be sure the line is entered correctly.

The Save and Load menu options are straightforward. First, MLX asks for a filename. (Again, pressing RETURN at this prompt without entering anything returns you to the command menu.) Next, MLX asks you to press either T or D for tape or disk. If you notice the disk drive starting and stopping several times during a load or save,

don't panic; this behavior is normal because MLX opens and reads from or writes to the file instead of using the usual LOAD and SAVE commands. For disk, the drive prefix 0: is automatically added to the filename (line 750), so this should *not* be included when entering the name. (This also precludes the use of @ for Save-with-Replace, so remember to give each version saved a different name.) MLX saves the entire workspace area from the starting to ending address, so the save or load may take longer than you might expect if you've entered only a small amount of data from a long listing. When saving a partially completed listing, make sure to note the address where you stopped typing so you'll know where to resume entry when you reload.

MLX reports any errors detected during the save or load. (Tape users should bear in mind that the Commodore 64 is never able to detect errors when saving to tape.) MLX also has three special load error messages: INCORRECT STARTING ADDRESS, which means the file you're trying to load does not have the starting address you specified when you ran MLX; LOAD ENDED AT *address*, which means the file you're trying to load ends before the ending address you specified when you started MLX; and TRUNCATED AT ENDING ADDRESS, which means the file you're trying to load extends beyond the ending address you originally specified. If you get one of these messages and feel certain that you've loaded the right file, exit and rerun MLX, being careful to enter the correct ending address.

The Quit menu option has the obvious effect—it stops MLX and enters BASIC at a READY prompt. Since the RUN/STOP key is disabled, Q lets you exit the program without turning off the computer. (Of course, RUN/STOP-RESTORE also gets you out.) You'll be asked for verification; press Y to exit to BASIC, or any other key to return to the menu. After quitting, you can type RUN again and reenter MLX without losing your data, as long as you don't use the clear workspace option.

The Finished Product

When you've finished typing all the data for an ML program and saved your work, you're ready to see the results. The instructions for loading the finished product vary from program to program. Some ML programs are designed to be loaded and run like BASIC programs, so all you need to type is LOAD *"filename"*,8 for disk or LOAD *"filename"* for tape, and then RUN. (Such programs usually have 0801 as their MLX starting address.) Others must be reloaded to specific addresses with a command such as LOAD *"filename"*,8,1 for disk or LOAD *"filename"*,1,1 for tape, then started with a SYS to a particular memory address. (On the Commodore 64, the most common starting address for such programs is 49152, which corresponds to MLX address C000.) In any case, you should always refer to the article which accompanies the ML listing for information on loading and running the program.

By the time you finish typing in the data for a long ML program, you'll have several hours invested in the project. Don't take chances—use our "Automatic Proofreader" to type in MLX, and then test your copy *thoroughly* before first using it to enter any significant amount of data. (Incidentally, MLX is included every month on the GAZETTE DISK.) Make sure all the menu options work as they should. Enter fragments of the program starting at several different addresses, then use the Display option to verify that the data has been entered correctly. And be sure to test the Save and Load options several times to ensure that you can recall your work from disk or tape. Don't let a simple typing error in MLX cost you several nights of hard work.

MLX

For instructions on entering this listing, refer to "How To Type In COMPUTE!'s GAZETTE Programs" elsewhere in this issue.

```
EK 100 POKE 56,50:CLR:DIM IN$,
       I,J,A,B,A$,B$,A(7),N$
DM 110 Z4=48:C6=16:C7=7:Z2=2:Z
       4=254:Z5=255:Z6=256:Z7=
       127
CJ 120 FA=PEEK(45)+Z6*PEEK(46)
       :BS=PEEK(55)+Z6*PEEK(56
       ):H$="0123456789ABCDEF"
SB 130 R$=CHR$(13):L$="{LEFT}"
       :S$=" ":D$=CHR$(20):Z$=
       CHR$(0):T$="{13 RIGHT}"
CQ 140 SD=54272:FOR I=SD TO SD
       +23:POKE I,0:NEXT:POKE
       {SPACE}SD+24,15:POKE 78
       8,52
FC 150 PRINT"{CLR}"CHR$(142)CH
       R$(8):POKE 53280,15:POK
       E 53281,15
EJ 160 PRINT T$" {RED}{RVS}
       {2 SPACES}{8 @}
       {2 SPACES}"SPC(28)"
       {2 SPACES}{OFF}{BLU} ML
       X II {RED}{RVS}
       {2 SPACES}"SPC(28)"
       {12 SPACES}{BLU}"
FR 170 PRINT"{3 DOWN}
       {3 SPACES}COMPUTE!'S MA
       CHINE LANGUAGE EDITOR
       {3 DOWN}"
JB 180 PRINT"{BLK}STARTING ADD
       RESS{43}";:GOSUB300:SA=A
       D:GOSUB1040:IF F THEN18
       0
GF 190 PRINT"{BLK}{2 SPACES}EN
       DING ADDRESS{43}";:GOSUB
       300:EA=AD:GOSUB1030:IF
       {SPACE}F THEN190
KR 200 INPUT"{3 DOWN}{BLK}CLEA
       R WORKSPACE [Y/N]{43}";A
       $:IF LEFT$(A$,1)<>"Y"TH
       EN220
PG 210 PRINT"{2 DOWN}{BLU}WORK
       ING...";:FORI=BS TO BS+
       EA-SA+7:POKE I,0:NEXT:P
       RINT"DONE"
DR 220 PRINTTAB(10)"{2 DOWN}
       {BLK}{RVS} MLX COMMAND
       {SPACE}MENU {DOWN}{43}":
       PRINT T$"{RVS}E{OFF}NTE
       R DATA"
ED 230 PRINT T$"{RVS}D{OFF}ISP
       LAY DATA":PRINT T$"
       {RVS}L{OFF}OAD DATA"
JS 240 PRINT T$"{RVS}S{OFF}AVE
        FILE":PRINT T$"{RVS}Q
       {OFF}UIT{2 DOWN}{BLK}"
JH 250 GET A$:IF A$=N$ THEN250
HK 260 A=0:FOR I=1 TO 5:IF A$=
       MID$("EDLSQ",I,1)THEN A
       =I:I=5
FD 270 NEXT:ON A GOTO420,610,6
       90,700,280:GOSUB1060:GO
       TO250
EJ 280 PRINT"{RVS} QUIT ":INPU
       T"{DOWN}{43}ARE YOU SURE
        [Y/N]";A$:IF LEFT$(A$,
       1)<>"Y"THEN220
EM 290 POKE SD+24,0:END
JX 300 IN$=N$:AD=0:INPUTIN$:IF
       LEN(IN$)<>4THENRETURN
KF 310 B$=IN$:GOSUB320:AD=A:B$
       =MID$(IN$,3):GOSUB320:A
       D=AD*256+A:RETURN
PP 320 A=0:FOR J=1 TO 2:A$=MID
       $(B$,J,1):B=ASC(A$)-C4+
       (A$>"@")*C7:A=A*C6+B
JA 330 IF B<0 OR B>15 THEN AD=
       0:A=-1:J=2
GX 340 NEXT:RETURN
CH 350 B=INT(A/C6):PRINT MID$(
       H$,B+1,1);:B=A-B*C6:PRI
       NT MID$(H$,B+1,1);:RETU
       RN
RR 360 A=INT(AD/Z6):GOSUB350:A
       =AD-A*Z6:GOSUB350:PRINT
       ":";
BE 370 CK=INT(AD/Z6):CK=AD-Z4*
       CK+Z5*(CK>Z7):GOTO390
PX 380 CK=CK*Z2+Z5*(CK>Z7)+A
JC 390 CK=CK+Z5*(CK>Z5):RETURN
QS 400 PRINT"{DOWN}STARTING AT
       {43}";:GOSUB300:IF IN$<>
       N$ THEN GOSUB1030:IF F
       {SPACE}THEN400
EX 410 RETURN
HD 420 PRINT"{RVS} ENTER DATA
       {SPACE}":GOSUB400:IF IN
       $=N$ THEN220
JK 430 OPEN3,3:PRINT
SK 440 POKE198,0:GOSUB360:IF F
        THEN PRINT IN$:PRINT"
       {UP}{5 RIGHT}";
GC 450 FOR I=0 TO 24 STEP 3:B$
       =S$:FOR J=1 TO 2:IF F T
       HEN B$=MID$(IN$,I+J,1)
HA 460 PRINT"{RVS}"B$L$;:IF I<
       24THEN PRINT"{OFF}";
HD 470 GET A$:IF A$=N$ THEN470
FK 480 IF(A$>"/"ANDA$<":")OR(A
       $>"@"ANDA$<"G")THEN540
MP 490 IF A$=R$ AND((I=0)AND(J
       =1)OR F)THEN PRINT B$;:
       J=2:NEXT:I=24:GOTO550
KC 500 IF A$="{HOME}" THEN PRI
       NT B$:J=2:NEXT:I=24:NEX
       T:F=0:GOTO440
MX 510 IF(A$="{RIGHT}")ANDF TH
       ENPRINT B$L$;:GOTO540
GK 520 IF A$<>L$ AND A$<>D$ OR
       ((I=0)AND(J=1))THEN GOS
```

```
      UB1060:GOTO470
HG 530 A$=L$+S$+L$:PRINT B$L$;
      :J=2-J:IF J THEN PRINT
      {SPACE}L$;:I=I-3
QS 540 PRINT A$;:NEXT J:PRINT
      {SPACE}S$;
PM 550 NEXT I:PRINT:PRINT"{UP}
      {5 RIGHT}";:INPUT#3,IN$
      :IF IN$=N$ THEN CLOSE3:
      GOTO220
QC 560 FOR I=1 TO 25 STEP3:B$=
      MID$(IN$,I):GOSUB320:IF
       I<25 THEN GOSUB380:A(I
      /3)=A
PK 570 NEXT:IF A<>CK THEN GOSU
      B1060:PRINT"{BLK}{RVS}
      {SPACE}ERROR: REENTER L
      INE [4]":F=1:GOTO440
HJ 580 GOSUB1080:B=BS+AD-SA:FO
      R I=0 TO 7:POKE B+I,A(I
      ):NEXT
QQ 590 AD=AD+8:IF AD>EA THEN C
      LOSE3:PRINT"{DOWN}{BLU}
      ** END OF ENTRY **{BLK}
      {2 DOWN}":GOTO700
GQ 600 F=0:GOTO440
QA 610 PRINT"{CLR}{DOWN}{RVS}
      {SPACE}DISPLAY DATA ":G
      OSUB400:IF IN$=N$ THEN2
      20
RJ 620 PRINT"{DOWN}{BLU}PRESS:
       {RVS}SPACE{OFF} TO PAU
      SE, {RVS}RETURN{OFF} TO
       BREAK[4]{DOWN}"
KS 630 GOSUB360:B=BS+AD-SA:FOR
      I=BTO B+7:A=PEEK(I):GOS
      UB350:GOSUB380:PRINT S$
      ;
CC 640 NEXT:PRINT"{RVS}";:A=CK
      :GOSUB350:PRINT
KH 650 F=1:AD=AD+8:IF AD>EA TH
      ENPRINT"{DOWN}{BLU}** E
      ND OF DATA **":GOTO220
KC 660 GET A$:IF A$=R$ THEN GO
      SUB1080:GOTO220
EQ 670 IF A$=S$ THEN F=F+1:GOS
      UB1080
AD 680 ONFGOTO630,660,630
CM 690 PRINT"{DOWN}{RVS} LOAD
      {SPACE}DATA ":OP=1:GOTO
      710
PC 700 PRINT"{DOWN}{RVS} SAVE
      {SPACE}FILE ":OP=0
RX 710 IN$=N$:INPUT"{DOWN}FILE
      NAME[4]";IN$:IF IN$=N$
      {SPACE}THEN220
PR 720 F=0:PRINT"{DOWN}{BLK}
      {RVS}T{OFF}APE OR {RVS}
      D{OFF}ISK: [4]";
FP 730 GET A$:IF A$="T"THEN PR
      INT"T{DOWN}":GOTO880
HQ 740 IF A$<>"D"THEN730
HH 750 PRINT"D{DOWN}":OPEN15,8
      ,15,"I0:":B=EA-SA:IN$="
      0:"+IN$:IF OP THEN810
SQ 760 OPEN 1,8,8,IN$+",P,W":G
      OSUB860:IF A THEN220
FJ 770 AH=INT(SA/256):AL=SA-(A
      H*256):PRINT#1,CHR$(AL)
      ;CHR$(AH);
PE 780 FOR I=0 TO B:PRINT#1,CH
      R$(PEEK(BS+I));:IF ST T
      HEN800
FC 790 NEXT:CLOSE1:CLOSE15:GOT
      O940
GS 800 GOSUB1060:PRINT"{DOWN}
      {BLK}ERROR DURING SAVE:
      [4]":GOSUB860:GOTO220
MA 810 OPEN 1,8,8,IN$+",P,R":G
      OSUB860:IF A THEN220
GE 820 GET#1,A$,B$:AD=ASC(A$+Z
      $)+256*ASC(B$+Z$):IF AD
      <>SA THEN F=1:GOTO850
KH 830 FOR I=0 TO B:GET#1,A$:P
      OKE BS+I,ASC(A$+Z$):IF
      {SPACE}ST AND(I<>B)THEN
       F=2:AD=I:I=B
FA 840 NEXT:IF ST<>64 THEN F=3
FQ 850 CLOSE1:CLOSE15:ON ABS(F
      >0)+1 GOTO960,970
SA 860 INPUT#15,A,A$:IF A THEN
       CLOSE1:CLOSE15:GOSUB10
      60:PRINT"{RVS}ERROR: "A
      $
GQ 870 RETURN
EJ 880 POKE183,PEEK(FA+2):POKE
      187,PEEK(FA+3):POKE188,
      PEEK(FA+4):IFOP=0THEN92
      0
HJ 890 SYS 63466:IF(PEEK(783)A
      ND1)THEN GOSUB1060:PRIN
      T"{DOWN}{RVS} FILE NOT
      {SPACE}FOUND ":GOTO690
CS 900 AD=PEEK(829)+256*PEEK(8
      30):IF AD<>SA THEN F=1:
      GOTO970
SC 910 A=PEEK(831)+256*PEEK(83
      2)-1:F=F-2*(A<EA)-3*(A>
      EA):AD=A-AD:GOTO930
KM 920 A=SA:B=EA+1:GOSUB1010:P
      OKE780,3:SYS 63338
JF 930 A=BS:B=BS+(EA-SA)+1:GOS
      UB1010:ON OP GOTO950:SY
      S 63591
AE 940 GOSUB1080:PRINT"{BLU}**
       SAVE COMPLETED **":GOT
      O220
AX 950 POKE147,0:SYS 63562:IF
      {SPACE}ST<>64 THEN970
FR 960 GOSUB1080:PRINT"{BLU}**
       LOAD COMPLETED **":GOT
      O220
DP 970 GOSUB1060:PRINT"{BLK}
      {RVS}ERROR DURING LOAD:
      {DOWN}[4]":ON F GOSUB98
      0,990,1000:GOTO220
PP 980 PRINT"INCORRECT STARTIN
      G ADDRESS (";:GOSUB360:
      PRINT")":RETURN
GR 990 PRINT"LOAD ENDED AT ";:
      AD=SA+AD:GOSUB360:PRINT
      D$:RETURN
FD 1000 PRINT"TRUNCATED AT END
      ING ADDRESS":RETURN
RX 1010 AH=INT(A/256):AL=A-(AH
      *256):POKE193,AL:POKE1
      94,AH
FF 1020 AH=INT(B/256):AL=B-(AH
      *256):POKE174,AL:POKE1
      75,AH:RETURN
FX 1030 IF AD<SA OR AD>EA THEN
      1050
HA 1040 IF(AD>511 AND AD<40960
      )OR(AD>49151 AND AD<53
      248)THEN GOSUB1080:F=0
      :RETURN
HC 1050 GOSUB1060:PRINT"{RVS}
      {SPACE}INVALID ADDRESS
       {DOWN}{BLK}":F=1:RETU
      RN
AR 1060 POKE SD+5,31:POKE SD+6
      ,208:POKE SD,240:POKE
      {SPACE}SD+1,4:POKE SD+
      4,33
DX 1070 FOR S=1 TO 100:NEXT:GO
      TO1090
PF 1080 POKE SD+5,8:POKE SD+6,
      240:POKE SD,0:POKE SD+
      1,90:POKE SD+4,17
AC 1090 FOR S=1 TO 100:NEXT:PO
      KE SD+4,0:POKE SD,0:PO
      KE SD+1,0:RETURN
```


Copies of articles from this publication are now available from the UMI Article Clearinghouse.

For more information about the Clearinghouse, please fill out and mail back the coupon below.

UMI Article Clearinghouse

Yes! I would like to know more about UMI Article Clearinghouse. I am interested in electronic ordering through the following system(s):

☐ DIALOG/Dialorder ☐ ITT Dialcom
☐ OnTyme ☐ OCLC ILL Subsystem

☐ Other (please specify)_____
☐ I am interested in sending my order by mail.
☐ Please send me your current catalog and user instructions for the system(s) I checked above.

Name_____
Title_____
Institution/Company_____
_____
Department_____
Address_____
City_____ State_____ Zip_____
Phone (_____)_____

Mail to: University Microfilms International
300 North Zeeb Road, Box 91 Ann Arbor, MI 48106

COMPUTE!'s GAZETTE Author Guide

Here are some suggestions which serve to improve the speed and accuracy of publication for prospective authors. COMPUTE!'s GAZETTE is primarily interested in new and timely articles on the Commodore 128, 64, Plus/4, 16, and VIC-20. We are much more concerned with the content of an article than with its style, but articles should as be clear and well-explained as possible.

The guidelines below will permit your good ideas and programs to be more easily edited and published:

1. The upper left corner of the first page should contain your name, address, telephone number, and the date of submission.

2. The following information should appear in the upper right corner of the first page. If your article is specifically directed to one model of computer, please state the model name. In addition, *please indicate the memory requirements of programs.*

3. The underlined title of the article should start about 2/3 of the way down the first page.

4. Following pages should be typed normally, except that in the upper right corner there should be an abbreviation of the title, your last name, and the page number. For example: Memory Map/Smith/2.

5. All lines within the text of the article must be double- or triple-spaced. A one-inch margin should be left at the right, left, top, and bottom of each page. No words should be divided at the ends of lines. And please do not justify. Leave the lines ragged.

6. Standard typing or computer paper should be used (no erasable, onionskin, or other thin paper) and typing should be on one side of the paper only (upper- and lowercase).

7. Sheets should be attached together with a paper clip. Staples should not be used.

8. If you are submitting more than one article, send each one in a separate mailer with its own tape or disk.

9. Short programs (under 20 lines) can easily be included within the text. Longer programs should be separate listings. *It is essential that we have a copy of the program, recorded twice, on a tape or disk.* If your article was written with a word processor, we also appreciate a copy of the text file on the tape or disk. Please use high-quality 10 or 30 minute tapes with the program recorded on both sides. The tape or disk should be labeled with the author's name and the title of the article. Tapes are fairly sturdy, but disks need to be enclosed within plastic or cardboard mailers (available at photography, stationery, or computer supply stores).

10. A good general rule is to spell out the numbers zero through ten in your article and write higher numbers as numerals (1024). The exceptions to this are: Figure 5, Table 3, TAB(4), etc. Within ordinary text, however, the zero through ten should appear as words, not numbers. Also, symbols and abbreviations should not be used within text: use "and" (not &), "reference" (not ref.), "through" (not thru).

11. For greater clarity, use all capitals when referring to keys (RETURN, CTRL, SHIFT), BASIC words (LIST, RND, GOTO), and the language BASIC. Headlines and subheads should, however, be initial caps only, and emphasized words are not capitalized. If you wish to emphasize, underline the word and it will be italicized during typesetting.

12. Articles can be of any length—from a single-line routine to a multi-issue series. The average article is about four to eight double-spaced, typed pages.

13. If you want to include photographs, they should be either 5×7 black and white glossies or color slides.

14. We do not consider articles which are submitted simultaneously to other publishers. If you wish to send an article to another magazine for consideration, please do not submit it to us.

15. COMPUTE!'s GAZETTE pays between $70 and $800 for published articles. In general, the rate reflects the length and quality of the article. Payment is made upon acceptance. Following submission (Editorial Department, COMPUTE!'s GAZETTE, P.O. Box 5406, Greensboro, NC 27403) it will take from two to four weeks for us to reply. If your work is accepted, you will be notified by a letter which will include a contract for you to sign and return. *Rejected manuscripts are returned to authors who enclose a self-addressed, stamped envelope.*

16. If your article is accepted and you have since made improvements to the program, please submit an entirely new tape or disk and a new copy of the article reflecting the update. We cannot easily make revisions to programs and articles. It is necessary that you send the revised version as if it were a new submission entirely, but be sure to indicate that your submission is a revised version by writing, "Revision" on the envelope and the article.

17. COMPUTE!'s GAZETTE does not accept unsolicited product reviews. If you are interested in serving on our panel of reviewers, contact our Feature's Editor for details.

The Automatic Proofreader

Philip I. Nelson, Assistant Editor

"The Automatic Proofreader" helps you type in program listings for the 128, 64, Plus/4, 16, and VIC-20 and prevents nearly every kind of typing mistake.

Type in the Proofreader *exactly* as listed. Since the program can't check itself, type carefully to avoid mistakes. Don't omit any lines, even if they contain unfamiliar commands. After finishing, save a copy or two on disk or tape before running it. This is important because the Proofreader erases the BASIC portion of itself when you run it, leaving only the machine language portion in memory.

Next, type RUN and press RETURN. After announcing which computer it's running on, the Proofreader displays the message "Proofreader Active". Now you're ready to type in a BASIC program.

Every time you finish typing a line and press RETURN, the Proofreader displays a two-letter checksum in the upper-left corner of the screen. Compare this result with the two-letter checksum printed to the left of the line in the program listing. If the letters match, it's almost certain the line was typed correctly. If the letters don't match, check for your mistake and correct the line.

The Proofreader ignores spaces not enclosed in quotes, so you can omit or add spaces between keywords and still see a matching checksum. However, since spaces inside quotes are almost always significant, the Proofreader pays attention to them. For example, **10 PRINT"THIS IS BASIC"** will generate a different checksum than **10 PRINT"THIS ISBA SIC"**.

A common typing error is transposition—typing two successive characters in the wrong order, like PIRNT instead of PRINT or 64378 instead of 64738. The Proofreader is sensitive to the *position* of each character within the line and thus catches transposition errors.

The Proofreader does *not* accept keyword abbreviations (for example, ? instead of PRINT). If you prefer to use abbreviations, you can still check the line by LISTing it after typing it in, moving the cursor back to the line, and pressing RETURN. LISTing the line substitutes the full keyword for the abbreviation and allows the Proofreader to work properly. The same technique works for rechecking programs you've already typed in.

If you're using the Proofreader on the Commodore 128, Plus/4, or 16, *do not perform any GRAPHIC commands while the Proofreader is active.* When you perform a command like GRAPHIC 1, the computer moves everything at the start of BASIC program space—including the Proofreader—to another memory area, causing the Proofreader to crash. The same thing happens if you *run* any program with a GRAPHIC command while the Proofreader is in memory.

Though the Proofreader doesn't interfere with other BASIC operations, it's a good idea to disable it before running another program. However, the Proofreader is purposely difficult to dislodge: It's not affected by tape or disk operations, or by pressing RUN/STOP– RESTORE. The simplest way to disable it is to turn the computer off then on. A gentler method is to SYS to the computer's built-in reset routine (SYS 65341 for the 128, 64738 for the 64, 65526 for the Plus/4 and 16, and 64802 for the VIC). These reset routines erase any program in memory, so be sure to save the program you're typing in before entering the SYS command.

If you own a Commodore 64, you may already have wondered whether the Proofreader works with other programming utilities like "MetaBASIC." The answer is generally yes, *if you're using a 64 and activate the Proofreader after installing the other utility.* For example, first load and activate MetaBASIC, then load and run the Proofreader.

When using the Proofreader with another utility, you should disable *both* programs before running a BASIC program. While the Proofreader seems unaffected by most utilities, there's no way to promise that it will work with any and every combination of utilities you might want to use. The more utilities activated, the more fragile the system becomes.

The New Automatic Proofreader

```
1Ø VEC=PEEK(772)+256*PEEK(773)
   :LO=43:HI=44
2Ø PRINT "AUTOMATIC PROOFREADE
   R FOR ";:IF VEC=42364 THEN
   {SPACE}PRINT "C-64"
3Ø IF VEC=5Ø556 THEN PRINT "VI
   C-2Ø"
4Ø IF VEC=35158 THEN GRAPHIC C
   LR:PRINT "PLUS/4 & 16"
5Ø IF VEC=17165 THEN LO=45:HI=
   46:GRAPHIC CLR:PRINT"128"
6Ø SA=(PEEK(LO)+256*PEEK(HI))+
   6:ADR=SA
7Ø FOR J=Ø TO 166:READ BYT:POK
   E ADR,BYT:ADR=ADR+1:CHK=CHK
   +BYT:NEXT
8Ø IF CHK<>2Ø57Ø THEN PRINT "*
   ERROR* CHECK TYPING IN DATA
    STATEMENTS":END
9Ø FOR J=1 TO 5:READ RF,LF,HF:
   RS=SA+RF:HB=INT(RS/256):LB=
   RS-(256*HB)
1ØØ CHK=CHK+RF+LF+HF:POKE SA+L
   F,LB:POKE SA+HF,HB:NEXT
11Ø IF CHK<>22Ø54 THEN PRINT "
   *ERROR* RELOAD PROGRAM AND
   {SPACE}CHECK FINAL LINE":EN
   D
12Ø POKE SA+149,PEEK(772):POKE
    SA+15Ø,PEEK(773)
13Ø IF VEC=17165 THEN POKE SA+
   14,22:POKE SA+18,23:POKESA+
   29,224:POKESA+139,224
14Ø PRINT CHR$(147);CHR$(17);"
   PROOFREADER ACTIVE":SYS SA
15Ø POKE HI,PEEK(HI)+1:POKE (P
   EEK(LO)+256*PEEK(HI))-1,Ø:N
   EW
16Ø DATA 12Ø,169,73,141,4,3,16
   9,3,141,5,3
17Ø DATA 88,96,165,2Ø,133,167,
   165,21,133,168,169
18Ø DATA Ø,141,Ø,255,162,31,18
   1,199,157,227,3
19Ø DATA 2Ø2,16,248,169,19,32,
   21Ø,255,169,18,32
2ØØ DATA 21Ø,255,16Ø,Ø,132,18Ø
   ,132,176,136,23Ø,18Ø
21Ø DATA 2ØØ,185,Ø,2,24Ø,46,2Ø
   1,34,2Ø8,8,72
22Ø DATA 165,176,73,255,133,17
   6,1Ø4,72,2Ø1,32,2Ø8
23Ø DATA 7,165,176,2Ø8,3,1Ø4,2
   Ø8,226,1Ø4,166,18Ø
24Ø DATA 24,165,167,121,Ø,2,13
   3,167,165,168,1Ø5
25Ø DATA Ø,133,168,2Ø2,2Ø8,239
   ,24Ø,2Ø2,165,167,69
26Ø DATA 168,72,41,15,168,185,
   211,3,32,21Ø,255
27Ø DATA 1Ø4,74,74,74,74,168,1
   85,211,3,32,21Ø
28Ø DATA 255,162,31,189,227,3,
   149,199,2Ø2,16,248
29Ø DATA 169,146,32,21Ø,255,76
   ,86,137,65,66,67
3ØØ DATA 68,69,7Ø,71,72,74,75,
   77,8Ø,81,82,83,88
31Ø DATA 13,2,7,167,31,32,151,
   116,117,151,128,129,167,136
   ,137
```

How To Type In *COMPUTE!'s GAZETTE* Programs

Each month, COMPUTE!'s GAZETTE publishes programs for the Commodore 128, 64, Plus/4, 16, and VIC-20. Each program is clearly marked by title and version. Be sure to type in the correct version for your machine. All 64 programs run on the 128 in 64 mode. Be sure to read the instructions in the corresponding article. This can save time and eliminate any questions which might arise after you begin typing.

We frequently publish two programs designed to make typing easier: The Automatic Proofreader, and MLX, designed for entering machine language programs.

When entering a BASIC program, be especially careful with DATA statements as they are extremely sensitive to errors. A mistyped number in a DATA statement can cause your machine to "lock up" (you'll have no control over the computer). If this happens, the only recourse is to turn your computer off then back on, erasing whatever was in memory. So be sure to *save a copy of your program before you run it.* If your computer crashes, you can always reload the program and look for the error.

Special Characters

Most of the programs listed in each issue contain special control characters. To facilitate typing in any programs from the GAZETTE, use the following listing conventions.

The most common type of control characters in our listings appear as words within braces: {DOWN} means to press the cursor down key; {5 SPACES} means to press the space bar five times.

To indicate that a key should be *shifted* (hold down the SHIFT key while pressing another key), the character is underlined. For example, A means hold down the SHIFT key and press A. You may see strange characters on your screen, but that's to be expected. If you find a number followed by an underlined key enclosed in braces (for example, {8 A}), type the key as many times as indicated (in our example, enter eight SHIFTed A's).

If a key is enclosed in special brackets, [ ], hold down the Commodore key (at the lower left corner of the keyboard) and press the indicated character.

Rarely, you'll see a single letter of the alphabet enclosed in braces. This can be entered on the Commodore 64 by pressing the CTRL key while typing the letter in braces. For example, {A} means to press CTRL-A.

The Quote Mode

Although you can move the cursor around the screen with the CRSR keys, often a programmer will want to move the cursor under program control. This is seen in examples such as {LEFT} and {HOME} in the program listings. The only way the computer can tell the difference between direct and programmed cursor control is *the quote mode.*

Once you press the quote key, you're in quote mode. This mode can be confusing if you mistype a character and cursor left to change it. You'll see a reverse video character (a graphics symbol for cursor left). In this case, you can use the DELete key to back up and edit the line. Type another quote and you're out of quote mode. If things really get confusing, you can exit quote mode simply by pressing RETURN. Then just cursor up to the mistyped line and fix it.

When You Read:	Press:	See:
{CLR}	SHIFT + CLR/HOME	
{HOME}	CLR/HOME	
{UP}	SHIFT + ↑ CRSR ↓	
{DOWN}	↑ CRSR ↓	
{LEFT}	SHIFT + ← CRSR →	
{RIGHT}	← CRSR →	
{RVS}	CTRL + 9	
{OFF}	CTRL + 0	
{BLK}	CTRL + 1	
{WHT}	CTRL + 2	
{RED}	CTRL + 3	
{CYN}	CTRL + 4	

When You Read:	Press:	See:
{PUR}	CTRL + 5	
{GRN}	CTRL + 6	
{BLU}	CTRL + 7	
{YEL}	CTRL + 8	
{ F1 }	f1	
{ F2 }	SHIFT + f1	
{ F3 }	f3	
{ F4 }	SHIFT + f3	
{ F5 }	f5	
{ F6 }	SHIFT + f5	
{ F7 }	f7	
{ F8 }	SHIFT + f7	

When You Read:	Press:	See:
←	←	
↑	SHIFT + ↑	

For Commodore 64 Only

When You Read:	Press:	See:
[1]	COMMODORE + 1	
[2]	COMMODORE + 2	
[3]	COMMODORE + 3	
[4]	COMMODORE + 4	
[5]	COMMODORE + 5	
[6]	COMMODORE + 6	
[7]	COMMODORE + 7	
[8]	COMMODORE + 8	

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

Shifter

Article on page 40.

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," which appears before the Program Listings.

Program 1: Shifter

```
AD 10 POKE56,60:POKE55,0:CLR:K
      M=15360:RO=1:PRINTCHR$(8
      ):DIMZ$(23)
AF 20 H=54272:FORI=HTOH+24:POK
      EI,0:NEXT:FORI=0TO15:POK
      EH+24,I:NEXT:POKEH+5,200
CS 30 POKEH+6,200:POKEH+4,17
JB 40 BC=53280:BK=53281:POKEBC
      ,6:POKEBK,6:PRINT"{CLR}
      {6 DOWN}{CYN}"SPC(6);
XB 50 PRINT"[D]{RVS}[D][F]
      {OFF}[F]{5 SPACES}{RVS}
      [F][D]{OFF}{5 SPACES}[C]
      {RVS}[F][D]{OFF}[V]
      {4 SPACES}{RVS}[K][D][F]
      {OFF}[F]"SPC(12)"[C]
      {RVS}[C]{OFF}[I]
      {6 SPACES}{RVS}[K]{OFF}
      [K]";
FJ 60 PRINTSPC(6)"{RVS}[K]
      {OFF}[K]{5 SPACES}{RVS}
      [K][C][V]{OFF}[V]"SPC(12
      )"[D][F]{RVS}[K]{OFF}[K]
      {5 SPACES}{RVS}[K]{OFF}
      [K]{6 SPACES}{RVS}[K]
      {OFF}[K]{5 SPACES}{RVS}
      [K][D][C]{OFF}";
CM 70 PRINTSPC(14)"{RVS}[2 I]
      {OFF}{6 SPACES}{RVS}
      [2 I]{OFF}{6 SPACES}[C]
      [V]{5 SPACES}[C][V][C]
      [V]{3 UP}"SPC(16);
MJ 80 PRINT"{RVS}[K]{OFF}[K]
      {RVS}[K]{OFF}[K]"SPC(4)"
      {RVS}[K][D][I]{OFF}[V]"S
      PC(4)"{RVS}[K][D][I]
      {OFF}[V]"SPC(20)"{RVS}
      [K][C][V]{OFF}[K]"SPC(4)
      "{RVS}[K][C]{OFF}[F]";
KQ 90 PRINTSPC(5)"{RVS}[K][C]
      {OFF}[F]"SPC(21)"{RVS}
      [K]{OFF}[K]{RVS}[K]{OFF}
      [K]"SPC(4)"{RVS}[K]{OFF}
      [K]"SPC(6)"{RVS}[K]{OFF}
      [K]"SPC(22)"[C][V][C][V]
      ";
XC 100 PRINTSPC(4)"[C][V]"SPC(
       6)"[C]{RVS}[2 I]{OFF}
       [V]{7 DOWN}":PRINTSPC(1
       4)"{WHT}ENTER LEVEL"
KX 110 PRINTSPC(16)"{DOWN}1
       {2 SPACES}2{2 SPACES}3
       {2 DOWN}{9 LEFT}FAST
       {3 SPACES}SLOW"
DE 120 KT$="":GETKT$:IFKT$<"1"
       ORKT$>"3"THEN120
HE 130 KT=VAL(KT$)+2:POKE850,K
       T
MA 140 PRINTSPC(12)"{5 UP}DESI
       GNING BOARD":PRINT"
       {DOWN}"SPC(14)"PLEASE W
       AIT{DOWN}"
KQ 150 PRINTSPC(14)"
       {11 SPACES}":A$(1)="*":
       A$(2)="B":A$(3)="N":A$(
       4)="M":A$(5)=" "
EA 160 B$="{RVS}{25 SPACES}":C
       $="{RVS} {OFF}":E$="
       {RVS}{CYN}{7 SPACES}":D
       $=E$+" ":GOSUB570
FM 170 FORI=1TO23:MT$=MT$+"
       {DOWN}{LEFT}"+C$:NEXT:M
       T$=MT$+"{HOME}"
FX 180 GOSUB420:PRINT"{CLR}";:
       POKEBC,3:POKEBK,0
AJ 190 PRINTD$"{BLU}"B$"{RVS}
       {CYN}{6 SPACES}":POKE10
       63,160:POKE55335,3
EM 200 FORI=1TO23:PRINTD$"
       {BLU}"C$"[83]"Z$(I)"
       {BLU}"C$E$;:NEXT:PRINTD
       $"{BLU}"B$"{RVS}{CYN}
       {6 SPACES}{HOME}"
QK 210 POKE2023,160:POKE56295,
       3:POKEBK,0
AS 220 PRINT"{HOME}{3 DOWN}
       {RVS}{CYN} {YEL}SCORE
       {2 DOWN}{4 LEFT}{CYN}"S
       1:PRINT"{4 DOWN}{RVS} R
       OUND{2 DOWN}{4 LEFT}"RO
SF 230 PRINT"{4 DOWN}{RVS}
       {CYN} [3]SCORE{2 DOWN}
       {4 LEFT}{CYN}"S2
QH 240 PRINT"{HOME}{6 DOWN}
       {RVS}"SPC(36)"S{2 DOWN}
       H{2 DOWN}{2 LEFT}I
       {2 DOWN}{2 LEFT}F
       {2 DOWN}T{2 DOWN}E
       {2 DOWN}{2 LEFT}R"
RX 250 IFCK=1THENCK=0:S1=0:S2=
       0:RO=1:KC=0:GOTO310
ED 260 POKE831,RND(0)*4:IFKCTH
       EN280
MA 270 GOSUB520
AJ 280 SYS15360:KC=1:SP=PEEK(1
       95)+256*PEEK(196):GOSUB
       430:POKESP,160
RD 290 RO=RO+1:IFS1=5ORS2=5THE
       NCK=1:RO=RO-1
HE 300 GOTO220
XH 310 PRINT"{HOME}{9 DOWN}
       {GRN}"SPC(16)"GAME OVER
       ":PRINT"{3 DOWN}"SPC(12
       )"PRESS FIREBUTTON"
XD 320 IF(PEEK(56320)ANDPEEK(5
       6321))AND16THEN320
SE 330 PRINT"{HOME}":FORI=1TO2
       3:PRINTD$"{BLU}"C$"[83]"
       Z$(I)"{BLU}"C$E$;:NEXT
GB 340 PRINTD$"{BLU}"B$"{RVS}
       {CYN}{6 SPACES}{HOME}
       {10 DOWN}":POKEBK,15
KE 350 PRINTSPC(15)"{BLK}ENTER
        LEVEL":PRINTSPC(18)"(1
       -3)"
PM 360 KT$="":GETKT$:IFKT$<"1"
       ORKT$>"3"THEN360
ME 370 KT=VAL(KT$)+2:POKE850,K
       T
DS 380 PRINT"{4 UP}"SPC(13)"
       {BLK}DESIGNING BOARD":P
       RINTSPC(18)"{5 SPACES}"
CK 390 FORI=1TO23:Z$(I)="":NEX
       T:GOSUB420:PRINT"{HOME}
       ";:GOTO190
CM 400 X=INT(28*RND(1))+1:IFX>
       4THENX=5
EX 410 RETURN
PS 420 FORZ=1TO23:FORI=1TO23:G
       OSUB400:Z$(Z)=Z$(Z)+A$(
       X):NEXTI,Z:RETURN
HX 430 IFSP<1063ORSP>1984THEN4
       70
KJ 440 S1=S1+1:TE=7:GOSUB540:F
       ORQ=1TO8:POKE646,TE:PRI
       NT"{HOME}"SPC(9)MT$"
       {HOME}"SPC(33)MT$
XG 450 IFTE=7THENTE=6:FORE=1TO
       130:NEXTE,Q:RETURN
AK 460 TE=7:NEXTQ:RETURN
QX 470 S2=S2+1:TE=2:GOSUB540:F
       ORQ=1TO8:POKE646,TEMP
PK 480 PRINT"{HOME}"SPC(8)B$:P
       RINT"{HOME}{24 DOWN}"SP
       C(8)B$"{HOME}"
EC 490 FORE=1TO75:NEXTE
GD 500 IFTE=2THENTE=6:NEXTQ:RE
       TURN
MJ 510 TE=2:NEXTQ:RETURN
HD 520 FORI=10TO255STEP20:FORL
       =255TO10STEP-50:POKEH+1
       ,I:POKEH,L:NEXT:NEXT
MC 530 POKEH,0:POKEH+1,0:RETUR
       N
SP 540 FORI=255TO120STEP-30:FO
       RL=10TO255STEP10:POKEH+
       1,L:POKEH,I:NEXT:NEXT
XH 550 GOTO530
QX 560 POKE646,6:RETURN
PQ 570 READA:IFA=256THENRETURN
KE 580 POKEKM,A:KM=KM+1:GOTO57
       0
QG 590 DATA 32,42,60,32,123,60
SK 600 DATA 32,175,60,32,54,61
FC 610 DATA 165,108,32,23,62,1
       65
BR 620 DATA 109,32,75,62,206,6
       5
MD 630 DATA 3,208,9,173,66,3
FF 640 DATA 141,65,3,32,155,62
KJ 650 DATA 32,12,62,76,6,60
RJ 660 DATA 173,27,3,201,243,2
       40
RC 670 DATA 23,169,49,133,100,
       169
SJ 680 DATA 12,133,101,169,0,1
       33
MB 690 DATA 98,169,252,133,99,
       169
FB 700 DATA 1,141,69,3,208,21
AM 710 DATA 169,49,133,100,169
       ,4
FF 720 DATA 133,101,169,0,133,
       98
QR 730 DATA 169,212,133,99,169
       ,0
EH 740 DATA 141,69,3,173,69,3
MD 750 DATA 10,10,24,105,3,170
FP 760 DATA 160,3,189,115,60,1
       53
XX 770 DATA 106,0,202,136,16,2
       46
CM 780 DATA 96,15,5,7,2,81
MH 790 DATA 101,103,66,165,100
       ,133
CK 800 DATA 3,133,5,24,105,195
RP 810 DATA 133,195,165,101,13
       3,4
DK 820 DATA 133,6,105,1,133,19
       6
CF 830 DATA 169,0,141,60,3,141
DE 840 DATA 61,3,169,32,141,64
BB 850 DATA 3,173,82,3,141,65
BC 860 DATA 3,141,66,3,169,11
HH 870 DATA 141,67,3,141,68,3
AM 880 DATA 96,162,0,32,244,61
RD 890 DATA 74,176,29,173,60,3
XM 900 DATA 240,121,206,60,3,1
       65
RK 910 DATA 106,32,23,62,165,3
AE 920 DATA 56,233,40,133,3,16
       5
RM 930 DATA 4,233,0,133,4,76
```

```
MK 940 DATA 53,61,74,176,31,17
       3
QF 950 DATA 60,3,201,22,240,87
RK 960 DATA 165,106,32,23,62,2
       38
MC 970 DATA 60,3,165,3,24,105
DP 980 DATA 40,133,3,165,4,105
PC 990 DATA 0,133,4,76,53,61
EE 1000 DATA 174,60,3,236,67,3
RE 1010 DATA 240,55,74,176,27,
       160
PC 1020 DATA 0,177,3,72,136,20
       0
JP 1030 DATA 200,192,23,240,8,
       177
PQ 1040 DATA 3,136,145,3,76,7
CQ 1050 DATA 61,104,136,145,3,
       76
XD 1060 DATA 53,61,74,176,22,1
       60
DE 1070 DATA 22,177,3,72,200,1
       36
PH 1080 DATA 136,48,8,177,3,20
       0
BA 1090 DATA 145,3,76,37,61,10
       4
GK 1100 DATA 200,145,3,96,162,
       1
PD 1110 DATA 32,244,61,74,176,
       55
DS 1120 DATA 174,61,3,236,68,3
PG 1130 DATA 240,44,160,0,177,
       5
PD 1140 DATA 72,165,5,133,252,
       165
MC 1150 DATA 6,133,253,162,21,
       160
FK 1160 DATA 40,177,252,160,0,
       145
SG 1170 DATA 252,165,252,24,10
       5,40
SH 1180 DATA 133,252,165,253,1
       05,0
QS 1190 DATA 133,253,202,16,23
       2,104
QC 1200 DATA 160,0,145,252,76,
       243
KC 1210 DATA 61,74,176,60,174,
       61
KQ 1220 DATA 3,236,68,3,240,11
       5
EX 1230 DATA 165,5,24,105,72,1
       33
DQ 1240 DATA 252,165,6,105,3,1
       33
BC 1250 DATA 253,160,40,177,25
       2,72
KB 1260 DATA 162,21,160,0,177,
       252
GE 1270 DATA 160,40,145,252,16
       5,252
QA 1280 DATA 56,233,40,133,252
       ,165
XA 1290 DATA 253,233,0,133,253
       ,202
RR 1300 DATA 16,232,104,160,40
       ,145
EJ 1310 DATA 252,76,243,61,74,
       176
AF 1320 DATA 29,173,61,3,240,5
       5
FP 1330 DATA 206,61,3,165,106,
       32
MJ 1340 DATA 75,62,165,5,56,23
       3
BF 1350 DATA 1,133,5,165,6,233
XB 1360 DATA 0,133,6,76,243,61
PJ 1370 DATA 74,176,28,173,61,
       3
QD 1380 DATA 201,22,240,21,238
       ,61
FS 1390 DATA 3,165,106,32,75,6
       2
BR 1400 DATA 165,5,24,105,1,13
       3
QX 1410 DATA 5,165,6,105,0,133
CC 1420 DATA 6,96,173,69,3,208
DJ 1430 DATA 4,189,0,220,96,18
       9
BP 1440 DATA 10,62,141,8,255,2
       34
RS 1450 DATA 234,234,173,8,255
       ,96
FB 1460 DATA 250,253,162,50,16
       0,0
PB 1470 DATA 136,208,253,202,2
       08,250
CX 1480 DATA 96,141,62,3,165,3
RA 1490 DATA 133,247,24,101,98
       ,133
JS 1500 DATA 252,165,4,133,248
       ,101
PG 1510 DATA 99,133,253,160,22
       ,173
SR 1520 DATA 62,3,145,252,177,
       247
RB 1530 DATA 201,81,240,13,174
       ,62
EK 1540 DATA 3,228,106,240,4,9
PX 1550 DATA 128,208,2,41,127,
       145
HH 1560 DATA 247,136,16,227,96
       ,141
CC 1570 DATA 62,3,165,5,24,101
AX 1580 DATA 98,133,252,165,6,
       101
HK 1590 DATA 99,133,253,162,22
       ,173
HS 1600 DATA 62,3,160,0,145,25
       2
QM 1610 DATA 165,252,56,229,98
       ,133
RK 1620 DATA 247,165,253,229,9
       9,133
DR 1630 DATA 248,160,0,177,247
       ,201
SM 1640 DATA 81,240,13,172,62,
       3
AF 1650 DATA 196,106,240,4,9,1
       28
CQ 1660 DATA 208,2,41,127,160,
       0
KQ 1670 DATA 145,247,165,252,2
       4,105
QB 1680 DATA 40,133,252,165,25
       3,105
EA 1690 DATA 0,133,253,202,16,
       195
CG 1700 DATA 96,173,64,3,160,0
QJ 1710 DATA 145,195,165,195,2
       4,101
GF 1720 DATA 98,133,252,165,19
       6,101
MA 1730 DATA 99,133,253,165,10
       6,145
GQ 1740 DATA 252,173,63,3,170,
       173
CR 1750 DATA 68,3,24,125,78,63
AA 1760 DATA 141,68,3,173,67,3
XX 1770 DATA 24,125,82,63,141,
       67
CA 1780 DATA 3,173,63,3,10,170
SG 1790 DATA 165,195,24,125,62
       ,63
GC 1800 DATA 133,195,165,196,1
       25,63
KQ 1810 DATA 63,133,196,177,19
       5,41
XS 1820 DATA 127,141,64,3,162,
       3
DC 1830 DATA 221,70,63,240,5,2
       02
FQ 1840 DATA 48,35,16,246,201,
       64
MH 1850 DATA 208,9,173,63,3,41
QP 1860 DATA 1,208,22,240,11,2
       01
PS 1870 DATA 66,208,7,173,63,3
DC 1880 DATA 41,1,240,9,173,63
FX 1890 DATA 3,93,74,63,141,63
MD 1900 DATA 3,169,81,145,195,
       165
QF 1910 DATA 195,24,101,98,133
       ,252
XA 1920 DATA 165,196,101,99,13
       3,253
QH 1930 DATA 177,252,41,15,201
       ,6
FS 1940 DATA 208,13,165,106,32
       ,23
GG 1950 DATA 62,165,106,32,75,
       62
MF 1960 DATA 104,104,96,165,10
       7,145
MB 1970 DATA 252,96,216,255,1,
       0
XQ 1980 DATA 40,0,255,255,64,6
       6
DB 1990 DATA 77,78,2,2,3,1
XE 2000 DATA 0,1,0,255,255,0
KD 2010 DATA 1,0,256
```

Program 2: Shifter—Replacement Lines For The Plus/4 And 16

```
MH 20 POKE2025,255
PB 40 COLOR0,7,1:COLOR4,7,1:PR
      INT"{CLR}{6 DOWN}{CYN}"S
      PC(6);
AJ 180 GOSUB420:PRINT"{CLR}";:
      COLOR4,4,6:COLOR 0,1
MP 190 PRINTD$;:GOSUB560:PRINT
      B$"{RVS}{CYN}{6 SPACES}
      ":POKE3111,160:POKE2087
      ,99
JR 200 FORI=1TO23:PRINTD$;:GOS
      UB560:PRINTC$;:COLOR1,2
      ,5:PRINTZ$(I);:GOSUB560
FS 202 PRINTC$E$;:NEXT:PRINTD$
      ;:GOSUB560:PRINTB$"
      {RVS}{CYN}{6 SPACES}
      {HOME}"
JJ 210 POKE4071,160:POKE3047,9
      9:COLOR0,1
DR 230 PRINT"{4 DOWN}{RVS}
      {CYN} ";:COLOR1,3,4:PRI
      NT"SCORE{2 DOWN}
      {4 LEFT}{CYN}"S2
MA 270 GOSUB520
HE 320 IFJOY(1)<128ANDJOY(2)<1
      28THEN320
GM 330 PRINT"{HOME}":FORI=1TO2
      3:PRINTD$;:GOSUB560
SA 332 PRINTC$;:COLOR1,2,5:PRI
      NTZ$(I);:GOSUB560:PRINT
      C$E$;:NEXT
AM 340 PRINTD$;:GOSUB560:PRINT
      B$"{RVS}{CYN}{6 SPACES}
      {HOME}{10 DOWN}":COLOR0
      ,2,5
GM 380 PRINT"{2 UP}"SPC(13)"
      {BLK}DESIGNING BOARD":P
      RINTSPC(18)"{5 SPACES}"
SD 430 IFSP<3111ORSP>4032THEN4
      70
SP 440 S1=S1+1:TE=103:GOSUB530
      :FORQ=1TO8:POKE1339,TE:
      PRINT"{HOME}"SPC(9)MT$"
      {HOME}"SPC(33)MT$
HM 450 IFTE=103THENTE=6:FORE=1
      TO130:NEXTE,Q:RETURN
CR 460 TE=103:NEXTQ:RETURN
BH 470 S2=S2+1:TE=2:GOSUB530:F
      ORQ=1TO8:POKE1339,TEMP
QJ 520 SOUND 1,150,50:FORB=8TO
      0STEP-1:VOLB:FORTD=1TO7
```

```
        5:NEXT:NEXT:RETURN
ES 530 VOL8:FORI=350TO550STEP2
       0:SOUND1,I,10:SOUND2,I-
       10,10:NEXT
AB 540 FORB=8TO1STEP-1:VOLB:FO
       RTD=1TO20:NEXT:NEXT:RET
       URN
AS 560 COLOR 1,7,1 :RETURN
```

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

ASCII Teleconverter

Article on page 78.

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," which appears before the Program Listings.

```
QG 10 A1$="{RVS}ASCII CONVERTE
      R{OFF}":PRINTCHR$(142):T
      $="{CLR}{DOWN}{7}"+A1$+A
      2$+"{2 DOWN}":S$=","
KR 20 PRINTT$:PRINT"THIS PROGR
      AM CONVERTS A CBM 'ASC'
      {SPACE}FILE"
HC 30 PRINT"INTO A STANDARD 'A
      SC' FILE AND -- VICE":PR
      INT"VERSA."
KC 40 PRINT"{2 DOWN}BE SURE YO
      U HAVE ROOM ON YOUR ORIG
      INAL"
HX 50 PRINT"DISK FOR THE CONVE
      RTED FILE.{DOWN}":PRINT:
      GOSUB390:PRINTT$
FA 60 PRINT"WHAT FORMAT DO YOU
      "
RQ 70 PRINT"WANT YOUR CONVERTE
      D"
AS 80 PRINT"SEQUENTIAL FILE TO
       BE?{DOWN}"
FD 90 PRINT"{RVS}S{OFF}TANDARD
       OR {RVS}C{OFF}OMMODORE
      {SPACE}ASCII?"
QH 100 GETFT$:IFFT$<>"S"ANDFT$
      <>"C"THEN100
AP 110 IFFT$="C"THENX1=96:X2=1
      23:X3=-32:X4=64:X5=91:X
      6=128
FD 120 IFFT$="S"THENX1=64:X2=9
      1:X3=32:X4=192:X5=219:X
      6=-128
SB 130 PRINTT$:PRINT"{2 DOWN}W
      HAT IS THE NAME OF"
HR 140 PRINT"THE FILE THAT YOU
      "
FB 150 PRINT"WISH TO CONVERT"
MR 160 INPUTNF$:IFNF$=""THENPR
      INT"{UP}";:GOTO160
CA 170 PRINTT$:PRINT"INSERT DI
      SK WITH"
HF 180 PRINT"ORIGINAL FILE IN
      {SPACE}DRIVE":GOSUB390
FS 190 PRINTT$:PRINT"CONVERTIN
      G
PM 200 PRINT"'"NF$;"' TO '"NF$
      "."FT$"'"
KD 210 OPEN15,8,15,"I0":OPEN8,
       8,8,"0:"+NF$+",S,R":GOS
       UB360
PH 220 OPEN9,8,9,"0:"+LEFT$(NF
       $,14)+"."+FT$+",S,W":GO
       SUB360
DP 230 GET#8,A$:A$=A$+CHR$(0):
       QP=ST:IFQP=64THEN290
MK 240 IFASC(A$)>X1ANDASC(A$)<
       X2THENB$=CHR$(ASC(A$)+X
       3):GOTO270
JX 250 IFASC(A$)>X4ANDASC(A$)<
       X5THENB$=CHR$(ASC(A$)+X
       6):GOTO270
PE 260 B$=A$
GB 270 PRINT#9,B$;
SK 280 PRINT"*";:GOTO230
KC 290 CLOSE8:CLOSE9:CLOSE15:P
       RINTT$:PRINT"CONVERSION
        COMPLETED!"
XB 300 PRINT"{2 DOWN}DO YOU HA
       VE ANOTHER
FF 310 PRINT"FILE TO CONVERT?"
PR 320 GETA$:IFA$=""THEN320
RK 330 IFA$="Y"THENRUN
HP 340 END
SX 350 REM ERROR CHECKING SUBR
       OUTINE
QM 360 INPUT#15,E$,F$,G$,H$
XK 370 IFVAL(E$)THENPRINTT$"
       {HOME}{6 DOWN}{RVS}
       {BLK}ERROR!{DOWN}":PRIN
       TE$;S$;F$:STOP
HS 380 RETURN
JX 390 PRINT"{DOWN}PRESS 'R' W
       HEN READY."
SJ 400 GETA$:IFA$<>"R"THEN400
EX 410 RETURN
```

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

VIC Dump

Article on page 80.

```
HF 10 F=0:C=PEEK(55)-251:IFC<0
      THENC=C+256:F=-1
PF 20 D=PEEK(56)+F:POKE55,C:PO
      KE56,D:CLR:PRINT"{CLR}
      {DOWN} LOADING DATA"
EC 30 N=PEEK(55)+256*PEEK(56)
QS 40 F=0:FORD=0TO250:READA$:I
      FASC(A$)<58THENA=VAL(A$)
      :CS=CS+A:GOTO80
DP 50 IFASC(A$)<>76THEN70
PD 60 A=VAL(RIGHT$(A$,LEN(A$)-
      1)):CS=CS+A+1:A=A+PEEK(5
      5):IFA>255THENA=A-256:F=
      1
BC 70 IFASC(A$)=72THENA=PEEK(5
      6)+F:F=0:CS=CS+2
HK 80 POKEN+D,A:PRINT"{HOME}
      {3 DOWN}"D:NEXT
MA 90 IFCS<>26550THENPRINT"
      {DOWN} ERROR IN DATA","
      {SPACE}STATEMENTS
FQ 100 PRINT"{DOWN} SYS"N
QB 110 DATA 173,2,144,41,127,1
       33,91,169,4,32,177,255,
       169,0,133,90
BJ 120 DATA 133,92,133,93,32,1
       47,255,169,8,133,89,32,
       168,255,173,3
KD 130 DATA 144,106,144,2,6,89
       ,41,63,72,169,10,32,168
       ,255,165,91
GR 140 DATA 72,32,L139,H0,160,
       7,162,6,62,218,2,106,20
       2,16,249,56
AP 150 DATA 106,32,168,255,136
       ,16,239,230,92,208,2,23
       0,93,104,56,233
HC 160 DATA 1,208,221,165,90,1
       05,6,133,90,56,229,89,1
       76,13,165,92
HP 170 DATA 56,229,91,133,92,1
       76,194,198,93,144,190,1
       33,90,104,233,1
JB 180 DATA 208,182,169,15,32,
       168,255,169,10,32,168,2
       55,76,174,255,44
FE 190 DATA L49,H0,208,2,9,128
       ,41,159,133,88,96,162,6
       ,165,90,72
SC 200 DATA 169,0,24,101,92,13
       3,87,8,173,5,144,106,10
       6,41,60,44
XQ 210 DATA 2,144,16,2,9,2,40,
       101,93,72,41,3,9,148,13
       3,88
GF 220 DATA 160,0,177,87,41,7,
       141,218,2,104,32,L127,H
       0,177,87,133
JQ 230 DATA 87,132,88,165,89,1
       06,38,87,38,88,106,144,
       249,173,5,144
KR 240 DATA 41,15,10,10,101,88
       ,32,L127,H0,104,168,173
       ,15,144,74,74
CB 250 DATA74,74,77,218,2,240,
       2,177,87,157,218,2,202,
       48,155,200
PK 260 DATA 196,89,144,231,169
       ,0,72,165,91,176,151
```

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

Cataloger

Article on page 79.

```
MS 10 DIMB$(800):IFPEEK(794)<>
      74THEN30
FR 20 POKE53281,15:POKE53280,1
      5:KB=198:RO=214:GOTO60
EJ 30 IFPEEK(794)<>189THEN50
KH 40 COLOR 0,16:COLOR 4,16:KB
      =208:RO=235:PRINTCHR$(27
      )"M":GOTO60
BA 50 RO=205:KB=239:POKE65301,
      241:POKE65305,241:POKE20
      25,255
RE 60 S$="{20 SPACES}":C=0:OPE
      N15,8,15:D$="{9 DOWN}"
GJ 70 PRINT"{CLR}{RVS}{RED}
      {6 SPACES}CHOOSE ONE OF
      {SPACE}THE FOLLOWING
      {7 SPACES}{BLU}{OFF}"
AG 80 PRINTSPC(5)"{2 DOWN}1. C
      ATALOG A SET OF DISKS"
BK 90 PRINTSPC(5)"{DOWN}2. SEE
       ALL FILE NAMES"
JJ 100 PRINTSPC(5)"{DOWN}3. PR
       INT ALL FILE NAMES"
SP 110 PRINTSPC(5)"{DOWN}4. SO
       RT NAMES ALPHABETICALLY
       "
KD 120 PRINTSPC(5)"{DOWN}5. CR
       EATE A SEQUENTIAL FILE"
AR 130 PRINTSPC(5)"{DOWN}6. CR
       EATE A PROGRAM FILE"
SX 140 PRINTSPC(5)"{DOWN}7. LO
       AD AN OLD FILE"
```

```
SM 150 PRINTSPC(5)"{DOWN}8. DE
       LETE A DISK"
QH 160 PRINTSPC(5)"{DOWN}9. ST
       ART NEW FILE"
MP 170 PRINTSPC(12)"{RED}
       {DOWN}{RVS} PRESS Q TO
       {SPACE}QUIT{BLU}{OFF}"
DD 180 POKEKB,0:WAITKB,1:GETA$
       :IFA$="Q"THENCLOSE15:PR
       INT"{CLR}":END
SP 190 IFA$<"1"ORA$>"9"THEN180
FS 200 ONVAL(A$)GOSUB210,510,5
       20,640,730,740,850,940,
       1040:GOTO70
JK 210 F$="DISK":GOSUB1050:IFD
       N$="Q"THENRETURN
QR 220 PRINT"{CLR}{RVS}{RED}"S
       PC(20-LEN(DN$)/2)DN$"
       {2 DOWN}{BLU}"
CP 230 CLOSE2:OPEN2,8,0,"$":GO
       SUB390:IFA$="Q"THENRETU
       RN
KG 240 X=4:NF=0:IFEXTHEN220
QK 250 B$(C)="":FL=-1:GOSUB310
       :X=2:GET#2,LN$
BJ 260 GET#2,HN$:NM=ASC(LN$+CH
       R$(0))+256*ASC(HN$+CHR$
       (0)):PRINTSPC(5)NM;
PF 270 GET#2,A$:IFA$=""THEN320
XD 280 IFA$=CHR$(34)THENFL=-FL
JJ 290 IFFL=1THENB$(C)=B$(C)+A
       $
RC 300 PRINTA$;:GOTO270
ER 310 FORA=1TOX:GET#2,A$:NEXT
       :RETURN
EQ 320 IFB$(C)=""THENCLOSE2:GO
       SUB480:IFA$<>"Q"THEN210
AC 330 IFB$(C)=""THENRETURN
XQ 340 PRINT:NM$=STR$(NM)
FA 350 B$(C)=RIGHT$(B$(C),LEN(
       B$(C))-1)
SC 360 B$(C)=B$(C)+LEFT$(S$,19
       -LEN(B$(C))-LEN(NM$))+N
       M$+"{2 SPACES}"+DN$
FE 370 IFNF=1THENC=C+1:IFC=800
       THEN1080
BS 380 NF=1:GOTO250
DQ 390 RF=0:EX=0:A$="":INPUT#1
       5,EN,M$,T,S
RC 400 IFEN<20THENRETURN
KQ 410 PRINT"{HOME}"D$:FORA=1T
       O5:PRINT"{35 SPACES}":N
       EXT
HB 420 EX=1:PRINT:PRINT"{HOME}
       {BLU}"D$EN;M$;T;S:IFEN<
       >63THEN470
RD 430 RF=1:PRINT"{DOWN} DO YO
       U WANT TO REPLACE THE F
       ILE? (Y/N)"
AB 440 GETA$:IFA$="N"THENRETUR
       N
CM 450 IFA$<>"Y"THEN440
JA 460 EX=0:PRINT#15,"S"+DN$:R
       ETURN
EK 470 CLOSE2
RS 480 PRINT:PRINT"{DOWN}{BLU}
       {2 SPACES}PRESS ANY KEY
        TO CONTINUE {RVS}Q TO
       {SPACE}QUIT{OFF}":POKEK
       B,0:WAITKB,1
PR 490 GETA$:RETURN
GP 500 PRINT:PRINT"{DOWN}{BLU}
       {6 SPACES}PRESS ANY KEY
        TO CONTINUE":POKEKB,0:
       WAITKB,1:RETURN
BG 510 DV=3:SA=0:SP=1:DN$="":N
       M=0:GOTO550
ER 520 PRINT"{CLR}"D$"PRESS [M
       ] TO RETURN TO THE MENU
        ANY{5 SPACES}OTHER KEY
        TO PRINT"
BF 530 POKEKB,0:WAITKB,1:GETA$
       :IFA$="M"THEN70
JP 540 DV=4:SP=20:SA=0:DN$="":
       NM=0
MB 550 IFC<=0THENPRINT"{CLR}"D
       $SPC(10)"{BLU}NO FILES
       {SPACE}IN MEMORY":GOTO5
       00
AX 560 IFNMTHENGOSUB1050:DN$="
       0:"+DN$+",S,W"
QR 570 CLOSE2:OPEN2,DV,SA,DN$:
       GOSUB390:IFA$="Q"THENRE
       TURN
MJ 580 IFRFANDEX=0THEN570
HX 590 IFRFTHEN560
QD 600 IFEXTHEN570
SP 610 PRINT"{CLR}{DOWN}":FORA
       =0TOC:PRINT#2,SPC(SP)B$
       (A)
FJ 620 IFPEEK(RO)=21THENGOSUB5
       00:PRINT"{CLR}{3 DOWN}"
SS 630 NEXT:CLOSE2:GOSUB500:RE
       TURN
GX 640 IFC<=0THENPRINT"{CLR}"D
       $SPC(10)"{BLU}NO FILES
       {SPACE}IN MEMORY":GOTO5
       00
MG 650 D=C-1:M=D:PRINT"{CLR}"D
       $SPC(15)"SORTING...."
AB 660 M=INT(M/2):IFM=0THENRET
       URN
EJ 670 J=0:K=D-M
JS 680 I=J
RK 690 L=I+M
MR 700 IFB$(I)>B$(L)THENT$=B$(
       I):B$(I)=B$(L):B$(L)=T$
       :I=I-M:IFI>0THEN690
CQ 710 J=J+1:IFJ>KTHEN660
PF 720 GOTO680
PS 730 DV=8:SP=5:SA=2:F$="FILE
       ":NM=1:DN$=DN$+",S,W":G
       OTO550
SX 740 GOSUB1050:DN$="0:"+DN$:
       IFDN$="0:Q"THENRETURN
BS 750 CLOSE2:OPEN2,8,2,DN$+",
       P,W":GOSUB390:IFA$="Q"T
       HENRETURN
KF 760 IFRFANDEX=0THEN750
GJ 770 IFRFTHEN740
KX 780 IFEXTHEN750
MK 790 PRINT#2,CHR$(1)CHR$(8);
       :FORA=0TOC-1
FG 800 PRINT#2,CHR$(4)CHR$(4);
       :LN=100+A
BE 810 HB=INT(LN/256):LB=LN-HB
       *256:PRINT#2,CHR$(LB)CH
       R$(HB);
AJ 820 PRINT#2,CHR$(34)B$(A)CH
       R$(34)CHR$(0);
QG 830 NEXTA:PRINT#2,CHR$(0)CH
       R$(0);
RJ 840 CLOSE2:RETURN
QH 850 F$="FILE":GOSUB1050:IFD
       N$="Q"THENRETURN
EC 860 OPEN2,8,2,"0:"+DN$+",S,
       R":GOSUB390:IFEXTHEN850
XE 870 FL=-1:B$(C)="":FORA=1TO
       5:GET#2,A$:NEXT
SP 880 GET#2,A$:IFA$=CHR$(13)T
       HEN910
BG 890 B$(C)=B$(C)+A$
QB 900 GOTO880
GP 910 IFSTTHENCLOSE2:RETURN
RK 920 C=C+1:IFC=800THEN1080
KD 930 GOTO870
QM 940 F$="DISK":GOSUB1050:IFD
       N$="Q"THENRETURN
DP 950 PRINT"{CLR}"D$SPC(14)"D
       ELETING":EN=0
KD 960 FL=0:FORA=0TOC-1
XH 970 IFMID$(B$(A),22,16)=DN$
       ANDFL=0THENFL=1:SN=A
RE 980 IFMID$(B$(A),22,16)<>DN
       $ANDFL=1THENEN=A:A=C
BP 990 NEXT:IFFL=0THENPRINT"
       {DOWN}"SPC(12)"FILE NOT
        FOUND":GOTO1030
PE 1000 IFEN=0THENEN=C+1:GOTO1
       020
GS 1010 FORA=SNTOC-(EN-SN):B$(
       A)=B$(EN+A-SN):NEXT
QG 1020 C=C-(EN-SN):PRINT"
       {DOWN}"SPC(14)"DELETED
       "
MH 1030 GOSUB500:C=C-(C<0):RET
       URN
FF 1040 C=0:RETURN
BK 1050 PRINT"{CLR}{4 DOWN} PU
       T DISK IN DRIVE AND EN
       TER "F$" NAME"
XG 1060 PRINT" (UP TO 16 CHARA
       CTERS) {RVS}Q TO QUIT
       {OFF}"
RH 1070 POKE19,1:INPUT"{DOWN}
       {RED} ";DN$:POKE19,0:D
       N$=LEFT$(DN$,16):RETUR
       N
HG 1080 PRINT"{CLR}"D$"{RED}TH
       E MASTER DIRECTORY IS
       {SPACE}FULL.{2 SPACES}
       SAVE THE PRESENT FILE
       {SPACE}AND ";
QR 1090 PRINT"START A NEW DIRE
       CTORY.{BLU}":GOSUB500:
       RETURN
```

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

Clavier 64

Article on page 84.

```
EF 10 PRINT"{CLR}{WHT}...PLEAS
      E WAIT":FORI=1TO61:READH
      ,L:POKE49664+I,H:POKE499
      20+I,L:NEXTI
JJ 20 CK=0:FORI=49152TO49252:R
      EADA:POKEI,A:CK=CK+A:NEX
      T
SH 30 IFCK<>11601THENPRINT"ERR
      OR IN DATA STATEMENTS.":
      STOP
XQ 40 PRINT"{3 DOWN}MACHINE CO
      DE LOADED"
PA 50 DATA 4,48, 4,113, 4,180,
       4,252, 5,72, 5,152, 5,2
      37, 6,71, 6,167, 7,12
HF 60 DATA 7,119, 7,233, 8,97,
       8,225, 9,104, 9,247, 10
      ,143, 11,48, 11,218, 12,
      143
HM 70 DATA 13,78, 14,24, 14,23
      9, 15,210, 16,195, 17,19
      4, 18,208, 19,239, 21,30
FC 80 DATA22,96, 23,180, 25,29
      , 26,156, 28,49, 29,222,
       31,164, 33,134, 35,133
DJ 90 DATA 37,161, 39,222, 42,
      61, 44,192, 47,105, 50,5
      9, 53,55, 56,97, 59,188
XA 100 DATA 63,73, 67,13, 71,9
      , 75,66, 79,188, 84,122
      , 89,127, 94,21, 100,11
      7
BR 110 DATA 106,111, 112,195,
      {SPACE}119,119, 126,146
      , 134,24
SD 115 REM ML CODE
SJ 120 DATA 162,0,189,0,193,32
      ,25,192,162
DR 130 DATA 7,189,0,193,32,25,
```

```
      192,162,14,189
HF 140 DATA 0,193,32,25,192,96
      ,41,128,201
PR 150 DATA128,240,25,189,0,19
      3,41,63,168
MM 160 DATA 185,0,195,157,0,21
      2,185,0,194
AB 170 DATA 157,1,212,189,113,
      192,157,4,212
ME 180 DATA 96,189,112,192,157
      ,4,212,96,162
BS 190 DATA0,189,0,193,32,88,1
      92,162,7
ER 200 DATA 189,0,193,32,88,19
      2,162,14,189
XS 210 DATA 0,193,32,88,192,96
      ,41,64,201,64
FA 220 DATA 240,6,189,114,192,
      157,4,212,96
XP 230 S=54272:FORI=0TO24:POKE
      S+I,0:NEXT
KK 240 POKES+5,35:POKES+6,196:
      POKES+12,35:POKES+13,19
      6:POKES+19,35:POKES+20,
      196
MQ 250 POKES+3,8:POKES+2,0:POK
      ES+10,8:POKES+9,0:POKES
      +17,8:POKES+16,0
JH 260 POKES+24,15
HX 270 W1=64:W2=64:W3=64: POKE
      49264,W1+8:POKE49265,W1
      +1:POKE49266,W1
CR 280 POKE49271,W2+8:POKE4927
      2,W2+1:POKE49273,W2
HP 290 POKE49278,W3+8:POKE4927
      9,W3+1:POKE49280,W3
GQ 300 V=100
CM 310 READN1,N2,N3:POKE49408,
      N1:POKE49415,N2:POKE494
      22,N3:IFN1=0THEN340
HK 320 SYS49152
CM 330 FORT=0TOV:NEXT:SYS49215
      :FORT=0TO50:NEXT:GOTO31
      0
MP 340 POKES+4,W1:POKES+11,W2:
      POKES+18,W3:FORT=0TO50:
      NEXT:POKES+24,0:END
SS 350 DATA102,98,81
PS 360 DATA102,98,17
FF 370 DATA102,98,192
AD 380 DATA39,36,192
MH 390 DATA100,97,69
EM 400 DATA100,97,5
QG 410 DATA36,97,192
HS 420 DATA34,33,192
MR 430 DATA98,98,74
GR 440 DATA98,98,74
CQ 450 DATA98,98,74
SX 460 DATA98,98,74
MS 470 DATA98,98,74
GS 480 DATA98,98,74
FB 490 DATA98,98,74
GP 500 DATA34,34,10
KX 1000 DATA0,0,0
```

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

The Coordinator

Article on page 72.

Program 1: Loader

```
SS 1 DATA L,1,H,A7,2,L,36,85,1
      ,4C,25
PE 2 DATA 93,A0,T,T,L,37,85,1,
      4C,8B,63
GD 3 DATA E3,L,37,85,1,60,L,0,
      H,2E,29
CC 4 DATA A0,Z,5,L,1,H,2E,A0,L
      ,36,1E
XR 5 DATA 85,1,4C,G,A0,A2,37,8
      6,1,85,1D
MX 6 DATA 45,20,E7,B0,20,A2,BB
      ,A6,61,E0,B9
MM 7 DATA 8A,B0,D,20,9B,BC,A5,
      64,A4,65,2E
SP 8 DATA A6,66,E0,80,K,3,68,6
      8,60,A2,9C
DH 9 DATA 36,86,1,60,P,FC,3,C9
      ,40,Z,BE
BQ 10 DATA 72,L,20,H,FF,3,A,H,
      FC,3,W
AD 11 DATA A0,0,G,FE,3,G,34,A0
      ,L,1,3B
GM 12 DATA H,FD,3,99,44,A0,99,
      4C,A0,C8,4C
AR 13 DATA A,D0,F6,P,0,DD,29,3
      ,H,2A,29
RH 14 DATA A0,L,3,38,W,2A,A0,A
      ,H,2A,5B
HE 15 DATA A0,A,A,A,A,A,H,30,A
      0,P,26
EC 16 DATA 18,D0,48,29,Z,4A,4A
      ,H,35,A0,4E
BM 17 DATA 68,29,8,Z,3,X,2A,A0
      ,P,2A,19
PM 18 DATA A0,C9,6,Z,9,C9,5,Z,
      5,P,23
CB 19 DATA 2A,A0,D0,5,A2,1A,4C
      ,B7,2,A,A8
EQ 20 DATA A,A,A,A,H,2D,A0,L,0
      ,H,2D
GJ 21 DATA 2C,A0,20,B8,A2,L,0,
      85,46,L,9B
HF 22 DATA 59,20,D6,2,C9,0,Z,3
      ,4C,BE,34
RG 23 DATA 2,C0,C8,K,3,4C,BE,2
      ,H,57,45
BB 24 DATA A0,G,56,A0,L,58,20,
      D6,2,C9,13
RH 25 DATA 2,K,3,4C,BE,2,C9,1,
      Z,2,BB
XF 26 DATA D0,7,C0,40,K,3,4C,B
      E,2,H,1A
KM 27 DATA 55,A0,G,54,A0,P,56,
      A0,H,40,3D
JG 28 DATA A0,A0,3,4E,40,A0,88
      ,D0,FA,38,A
AE 29 DATA L,18,W,40,A0,H,40,A
      0,L,7,19
JX 30 DATA 2D,56,A0,H,41,A0,38
      ,L,7,W,P
PR 31 DATA 41,A0,H,41,A0,P,55,
      A0,O,54,37
GM 32 DATA A0,H,43,A0,G,42,A0,
      A0,3,18,A
JX 33 DATA 4E,43,A0,6E,42,A0,8
      8,D0,F7,L,75
FM 34 DATA 7,2D,54,A0,H,43,A0,
      38,L,7,3F
PK 35 DATA W,43,A0,H,43,A0,L,0
      ,H,29,21
JR 36 DATA A0,P,40,A0,A0,6,A,2
      E,29,A0,9D
ES 37 DATA 88,D0,F9,H,28,A0,18
      ,P,40,A0,9B
JC 38 DATA 6D,29,A0,H,29,A0,L,
      0,H,FF,98
KD 39 DATA 2,P,42,A0,A,A,A,K,3
      ,X,Q
EC 40 DATA 29,A0,18,6D,28,A0,H
      ,28,A0,K,10
BK 41 DATA 3,X,29,A0,18,P,41,A
      0,6D,28,3
CR 42 DATA A0,H,28,A0,H,36,A0,
      K,3,X,D6
QD 43 DATA 29,A0,P,29,A0,H,37,
      A0,18,P,52
EQ 44 DATA 2C,A0,6D,28,A0,H,28
      ,A0,P,2D,5
EF 45 DATA A0,6D,29,A0,H,29,A0
      ,P,28,A0,9F
GA 46 DATA H,44,A2,H,79,A2,P,2
      9,A0,H,41
SA 47 DATA 45,A2,H,7A,A2,A0,3,
      4E,37,A0,8A
KA 48 DATA 6E,36,A0,88,D0,F7,P
      ,36,A0,H,2C
SG 49 DATA 4C,A2,H,3E,A2,18,P,
      35,A0,6D,E
XC 50 DATA 37,A0,H,4D,A2,18,L,
      D8,6D,37,23
PM 51 DATA A0,H,3F,A2,20,83,A2
      ,P,23,D0,CF
PQ 52 DATA 29,F,Q,32,A0,Z,3,H,
      0,4,31
XF 53 DATA 20,60,A3,P,0,4,85,2
      ,P,5C,18
AK 54 DATA A0,H,0,4,20,6A,A3,O
      ,43,A0,84
EF 55 DATA B9,44,A0,48,25,2,Z,
      3,H,FF,A7
GC 56 DATA 2,68,Q,2E,A0,D0,A,Q
      ,FF,2,D8
BA 57 DATA D0,11,5,2,18,K,9,Q,
      FF,2,5E
DP 58 DATA Z,7,49,FF,25,2,H,0,
      4,L,J
FP 59 DATA 0,H,2E,A0,4C,BE,2,P
      ,16,D0,BC
JH 60 DATA 29,10,H,32,A0,P,86,
      2,A0,4,6C
JB 61 DATA A,88,D0,FC,H,5C,A0,
      P,32,A0,82
FR 62 DATA Z,F,P,22,D0,29,F,18
      ,6D,5C,5C
JE 63 DATA A0,H,5C,A0,18,K,C,P
      ,21,D0,69
SB 64 DATA 29,F,18,6D,5C,A0,H,
      5C,A0,60,11
HC 65 DATA 20,83,A2,P,30,A0,18
      ,6D,35,A0,82
BF 66 DATA H,35,A0,L,0,H,3C,A0
      ,P,A7,6D
FX 67 DATA 2,Z,8,L,0,H,A7,2,4C
      ,5F,3A
PP 68 DATA A3,P,2D,A0,H,38,A0,
      L,1F,H,84
JH 69 DATA 3A,A0,L,40,H,3B,A0,
      P,38,A0,94
AM 70 DATA H,FB,A2,L,0,H,FA,A2
      ,A8,Q,59
RX 71 DATA 3A,A0,P,3C,A0,99,0,
      4,C8,D0,16
AK 72 DATA FA,X,FB,A2,CA,D0,F4
      ,O,FB,A2,33
HF 73 DATA G,15,A3,O,FA,A2,G,1
      4,A3,A0,55
GS 74 DATA 0,99,0,4,C8,CC,3B,A
      0,D0,F7,B2
GM 75 DATA P,FB,A2,C9,DB,Z,3C,
      P,38,A0,75
SC 76 DATA CD,35,A0,Z,1C,P,5C,
      A0,H,3C,19
KB 77 DATA A0,P,35,A0,H,38,A0,
      L,3,H,6C
SB 78 DATA 3A,A0,L,R,H,3B,A0,2
      0,60,A3,87
BK 79 DATA 18,K,A0,20,6A,A3,P,
      32,A0,Z,5A
PH 80 DATA 10,P,23,D0,29,F,H,3
      C,A0,L,15
HD 81 DATA D8,H,38,A0,4C,E7,A2
      ,60,L,7F,1A
HE 82 DATA H,D,DC,L,34,85,1,60
      ,L,36,6D
FP 83 DATA 85,1,L,81,H,D,DC,60
      ,0,0,6
PC 84 A=681:H=707:U=10:S=1:R=8
      3:R=R-1
SJ 85 D=0:E$=CHR$(147):M$(1)="
```

```
      LINE # ":M$(2)="DATA ":M
      $(3)=E$+"RECHECK ALL LIN
      ES "
RC 86 PRINTE$" PLEASE WAIT 2 M
      IN. 40 SEC."
BM 87 FORI=STOS+R:E=I:FORJ=1TO
      U:READN$
XC 88 IFJ=1THENM=PEEK(63)+PEEK
      (64)*256:IFM<>ITHENF=1:G
      OTO98
EE 89 GOSUB99
HG 90 ON-(F=2)GOTO98
DJ 91 POKEA,N:A=A+1-(A=764)*40
      335
EM 92 E=E-N-J+U-((N+J-U>E)*(2*
      (N+J-U-E))):D=D+N
FQ 93 NEXT:READN$:GOSUB99
MX 94 IFN<>ETHENF=2:GOTO98
GP 95 NEXT
HM 96 IFD<>94716THENF=3:GOTO98
MA 97 PRINT"OK! SYS"H:END
SJ 98 PRINTE$"LINE"M"HAS "M$(F
      )"ERROR":STOP
GJ 99 L=LEN(N$):C=ASC(N$):ON-(
      L<2ANDC>=71ANDC<=90)GOTO
      104
HG 100 N(1)=0:N(2)=N(1)
AR 101 IFL>2THENF=2:GOTO106
RX 102 FORK=1TOL:H$(K)=MID$(N$
      ,K,1):N(K)=ASC(H$(K)):N
      (K)=N(K)-55-(N(K)<65)*7
BP 103 NEXT:N=N(2)-16*(L=2)*N(
      1)-(L=1)*N(1):GOTO105
MF 104 N=C:N=N+69-(N>=76)*24-(
      N>=82)*57
RA 105 IFN<0ORN>255THENF=2
MR 106 RETURN
```

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," which appears before the Program Listings.

Program 2: Object Maker

```
KK 10 SA=53239:FORI=0TO8:READM
      L:POKESA+I,ML:NEXT
KQ 20 DATA 32,248,2,32,237,245
      ,76,190,2
EM 30 D=8:E=65
EJ 40 SYS57812CHR$(E)+" COORD.
      OBJ",D,1
GQ 50 POKE193,169:POKE194,2:PO
      KE174,253:POKE175,2
GH 60 SYS62957:E=E+1
DM 70 SYS57812CHR$(E)+" COORD.
      OBJ",D,1
GF 80 POKE193,140:POKE194,160:
      POKE174,116:POKE175,163
AM 90 SYSSA
```

Program 3: Demo

```
GA 5 REM *** LOAD ML FROM DISK
     OR TAPE ***
AP 10 D=8:E=65:A=E:F=147:E$=CH
      R$(F):P=57812:L=62631:S=
      62957:IFPEEK(687)=54THEN
      25
HD 15 POKEF,0:SYSPCHR$(E)+" CO
      ORD.OBJ",D,1:SYSL:E=E+1:
      IFE<A+2THEN15
SG 20 REM *** SET COORDINATOR
      {SPACE}VARIABLES ***
FG 25 RESET=681:CLEAR=686:PLOT
      =707:ERASE=714
HX 30 SETFLAG=767:INIT=1020:MF
      LAG=0:REM MFLAG=1 TURNS
      {SPACE}ON MULTICOLOR, 0
      {SPACE}IS OFF
GX 35 REM *** SET COLOR REGIST
      ERS ***
PB 40 FG=646:BO=53280:BG=BO+1
GE 45 IFMFTHENM2=BO+2:M3=BO+3:
      POKEM2,6:POKEM3,4:REM SE
      T MULTICOLOR REGS. (M1=F
      G)
EH 50 REM *** SET HI-RES VARIA
      BLES ***
GS 55 BANK=1:SCNOFFSET=1:COLOF
      FSET=7:GOSUB185
JB 60 REM *** CREATE DISPLAY (
      FROM LINE 65 TO LINE 145
      ) ***
HB 65 POKEBO,0:POKEBG,0:POKEFG
      ,1:Y=100:X=160:SYSCLEAR:
      O=X:N=Y:REM SET SCREEN
MA 70 FORR=7TO87STEP8:POKEBG,-
      (R/8>7)*R/7:POKEFG,R/7-8
      *(R/8>7):REM RADIUS & CO
      LOR
EG 75 FORA=0TO↑/2STEP2/R:X=R*S
      IN(A)+O:Y=R*COS(A)+N:SYS
      PLOT:REM SWEEP 90 DEGREE
      S
XD 80 X=-X+2*O:SYSPLOT:Y=-Y+2*
      N:SYSPLOT:X=-X+2*O:SYSPL
      OT:REM BUT PLOT 4 QUADRA
      NTS
EG 85 NEXTA
HR 90 NEXTR
FH 95 IFMFTHENPOKEM3,5:REM BIT
       PATTERN 1,1 PLOTS GREEN
      IF MULTICOLOR
EC 100 Y=100:FORX=0TO319:POKEB
      G,X/8:POKEFG,X/8+1:SYSP
      LOT:NEXT:REMDRAW COLORE
      D LINE
RG 105 POKEBG,0:POKEFG,10:FORX
      =0TO319:SYSERASE:NEXT:R
      EM ERASE LINE WITH LT.
      {SPACE}RED
HR 110 Y=95:POKEFG,1:FORX=0TO3
      19:SYSPLOT:IFPEEK(SETFL
      AG)THENSYSPLOT:GOTO120
BB 115 SYSERASE:REM 95-105 MOV
      E A WHITE POINT BUT DON
      'T ERASE
CJ 120 NEXT
CA 125 DEFFNMC(A)=INT(A)-(INT(
      A/2)<>INT(A)/2):SYSCL:R
      =95:POKE646,2
JG 130 FORA=0TO319STEP2.26:X=F
      NMC(A):Y=R+80*SIN(A/20)
      :SYSER:X=X+1:SYSPL:NEXT
RS 135 FORA=0TO319STEP2.26:X=F
      NMC(A):Y=R+60*SIN(A/25)
      :SYSPL:X=X+1:SYSER:NEXT
SD 140 FORA=0TO319STEP2.26:X=F
      NMC(A):Y=R+40*SIN(A/30)
      :SYSPL:X=X+1:SYSPL:NEXT
JS 145 FORA=0TO319STEP2.26:X=F
      NMC(A):Y=R+60*SIN(A/25)
      :SYSER:X=X+1:SYSER:NEXT
JF 150 REM *** RESTORE DEFAULT
       DISPLAY ***
SG 155 IFPEEK(198)=0THEN155:RE
      M WAIT FOR A KEYPRESS T
      O END PROGRAM
JF 160 POKE198,0:REM TIDY UP K
      EYPRESS IF IT COMES
AF 165 POKEFG,PEEK(BG)+1:REM E
      NSURE TEXT COLOR IS DIF
      FERENT FROM BACKGROUND
CR 170 POKE53270,200:POKE56576
      ,151:POKE53265,27:POKE5
      3272,21:IFSFTHENRETURN
KB 175 END
HF 180 REM *** SET UP HI-RES *
      **
MR 185 POKE56576,(PEEK(56576)A
      ND252)OR(3-BANK):REM SE
      T BANK
AC 190 POKE53265,PEEK(53265)OR
      32:REM TURN ON BITMAP
ED 195 IFMFTHENPOKE53270,PEEK(
      53270)OR16:REM SET MULT
      ICOLOR IF DESIRED
PX 200 POKE53272,(COLOFFSET*16
      +SCNOFFSET*8):REM POSIT
      ION HI-RES AND COLOR ME
      MORIES
GD 205 RETURN
```

Program 4: Mountain Demo

```
RG 65 POKE198,0:POKEFG,11:POKE
      BG,0:POKEBO,0:X=-1:Y=-1:
      SYSCL
GE 66 J%=RND(0)*10:J%=-J%*(J%>
      3ANDJ%<7):ON-(J%=0)GOTO6
      6:?J%=J%-4:C=2↑J%
HD 67 J=35-(C=1)*17:V=2:A=-20:
      J%=RND(0)*5:B=-J%*20:Z=1
      :E=0
BA 68 H=INT((320-B)/(J-10)):DI
      M G(H+1):G(0)=B:DEFFNP(M
      )=(-1)↑INT(RND(0)*3)
HS 69 DEFFNM(R)=(N+(N<80)*N*.3
      )/133+(N>180)*(N-180)/79
EM 70 FORQ=1TOH:G(Q)=G(Q-1)+J+
      RND(0)*10:IFG(Q)>=320THE
      NO=Q:Q=H
CF 71 NEXT:DIMR(O+1,2),T(O+1,2
      ),U(O+1),B(O+1):J%=RND(0
      )*5:M=10+(J%+4-C)*5
HM 72 J%=-(C>1):R(0,0)=G(0):T(
      0,0)=RND(0)*3.3-A:U(0)=1
SF 73 FORQ=1TOO:R(Q,0)=G(Q):U(
      Q)=U(Q-1)*(1+2*(Q/C=INT(
      Q/C)))
BC 74 T(Q,0)=T(Q-1,0)+((RND(0)
      *3.3+2)*U(Q)):N=R(Q,0)
JM 75 T(Q,0)=T(Q,0)-(N<=160)*N
      /80+(N>160)*N/120:GOSUB8
      3:B(Q)=-(K>I):NEXT:E=1
QH 76 V=V+.004:M=M+V↑1.0001:R(
      0,1)=R(0,0)+.9+RND(0)*.5
      *FNP(M)
EK 77 T(0,1)=T(0,0)+RND(0)*2:F
      ORQ=1TOO
EM 78 R(Q,1)=R(Q,0)+(1+(B(Q)=0
      ANDB(Q+1)=1)*J%)*(RND(1)
      *(2+C/2)+.3)
KE 79 N=R(Q,1):T(Q,1)=T(Q-1,1)
      +T(Q,0)-T(Q-1,0)+RND(0)*
      2
KF 80 T(Q,1)=T(Q,1)-(B(Q)=1)*R
      ND(1)*M*FNM(R)/20:IFR(Q,
      1)>R(Q-1,1)THEN82
AR 81 R(Q,1)=R(Q-1,1)+.01:IFQ>
      =3THENT(Q,1)=T(Q-1+(C=1)
      *2,1)-6
JR 82 GOSUB83:R(Q,0)=R(Q,1):T(
      Q,0)=T(Q,1):NEXT:R(0,0)=
      R(0,1):T(0,0)=T(0,1):GOT
      O76
HB 83 H=R(Q-1,E):I=T(Q-1,E):J=
      R(Q,E):K=T(Q,E)
FK 84 W=(J-H)*(1.3+RND(0)*.9-(
      K<I)*1.7*(RND(0)+1))/SQR
      ((J-H)↑2+(K-I)↑2)
SS 85 IFK>170ANDJ>0ANDJ<320THE
      NJ=R(Q,0):K=T(Q,0):Z=0
CD 86 FORX=HTOJSTEPW:Y=I+(K-I)
      *(X-H)/(J-H):SYSPL:NEXT:
      IFZTHENRETURN
JX 87 FORY=0TO199STEP8:FORX=0T
      O319STEP8:U=FNP(M)*RND(0
      )*24
CH 88 POKEFG,7+2*(Y>36+U)-9*(Y
```

```
      >76+U)+13*(Y>114+U):SYSE
      R:IFPEEK(SE)THENSYSPL
JE 89 NEXT:NEXT:POKE49,PEEK(47
      ):POKE50,PEEK(48):GOSUB2
      20
```

Program 5: Save/Load Subroutine

```
HD 210 REM *** SCREEN SAVE/LOA
       D SUBROUTINE ***
JC 215 REM NOTE: IS DEPENDENT
       {SPACE}ON VARIABLES FRO
       M MAIN PROGRAM
XA 220 D=8:E=49:OK=1:B(1)=BA*6
       4+SC*32:T(1)=B(1)+32:B(
       2)=BA*64+CO*4:T(2)=B(2)
       +4
XH 225 B(3)=208:T(3)=B(3)+1:B(
       4)=216:T(4)=B(4)+4:SF=1
       :GOSUB165:SF=0
ME 230 PRINTE$:PRINT
KC 235 PRINTTAB(7)"** SAVE OR
       {SPACE}LOAD SCREEN **":
       PRINT:INPUT"{2 SPACES}S
       CREEN NAME";SN$
CP 240 GV=LEN(SN$):ON-(GV<1ORG
       V>15)GOTO230:PRINT
EE 245 PRINT"> FOR SAVE - PRES
       S {RVS}S{OFF}":PRINT:PR
       INT"> FOR LOAD - PRESS
       {SPACE}{RVS}L{OFF}"
BX 250 GETL$:IFL$=""ORL$<>"S"A
       NDL$<>"L"THEN250
SG 255 PRINT:PRINT:PRINT"
       {RVS}RESULTS{OFF} - NAM
       E IS "SN$:PRINTTAB(11)"
       AND THIS IS A ";
GJ 260 IFL$="S"THENPRINT"SAVE"
       :GOTO270
JK 265 PRINT"LOAD"
FM 270 PRINT:PRINT:PRINTTAB(6)
       ">> IF CORRECT - PRESS
       {SPACE}{RVS}C{OFF} <<"
FH 275 PRINT:PRINTTAB(5)"ANY O
       THER KEY ALLOWS CHANGES
       "
DF 280 GETM$:ON-(M$="")-2*(M$=
       "C")GOTO280,290
XG 285 GOTO230
GK 290 PRINTE$:PRINT" SAVING:"
       SN$:IFL$="L"THENPRINTE$
       :PRINT" LOADING:"SN$:GO
       TO320
KP 295 SYSP"@:"+CHR$(E)+SN$,D,
       1:POKE193,0:POKE194,B(O
       K)
FC 300 POKE174,0:POKE175,T(OK)
       :SYSS
JA 305 E=E+1:OK=OK+1:IFOK<4THE
       N295
BS 310 IFMFANDOK=4THEN295
RJ 315 GOTO340
RS 320 POKEF,0:SYSPCHR$(E)+SN$
       ,D,1:SYSL
MQ 325 E=E+1:IFE<52THEN320
DE 330 IFMFANDE=52THEN320
GR 335 IFD<>8THEN355
XQ 340 QA=0:OPEN15,8,15:INPUT#
       15,QA,QB$,QC,QD:CLOSE15
       :IFQA<20THEN355
GK 345 PRINTE$:PRINT" DISK ERR
       OR!":PRINTTAB(13)
       "{RVS} DISK STATUS
       {OFF}"
EF 350 PRINT:PRINTTAB(7)QA;QB$
       ;QC;QD:END
QM 355 GOSUB185:RETURN
```

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

Number Construction Kit

Article on page 86.

```
AF 10 REM{2 SPACES}*NUMBER CON
      STRUCTION KIT*
DG 20 POKE53280,.:POKE53281,.:
      CC=211:Q=214:Y=198:C0=55
      856:SC=1622:B$=CHR$(150)
JB 30 Z=200:F$=CHR$(156):G$=CH
      R$(5):H$=CHR$(98):I$=CHR
      $(99):J$=CHR$(147)
GB 40 K$=CHR$(174):L$=CHR$(173
      ):M$=CHR$(189):N$=CHR$(1
      76):O$=CHR$(32):Q$=CHR$(
      125)
XQ 50 U$=CHR$(157):W$="
      {4 SPACES}":P=1:X=32
EQ 60 PRINTJ$B$SPC(7)N$;:FORI=
      .TO22:PRINTI$;:NEXT:PRIN
      TK$
DX 70 PRINTSPC(7)H$G$"NUMBER C
      ONSTRUCTION KIT"B$H$:PRI
      NTSPC(7)L$;:FORI=.TO22
SK 80 PRINTI$;:NEXT:PRINTM$:PR
      INT:PRINT:PRINTF$"TOOLS:
      "G$" + - * /"SPC(19)B$"T
      IME"
DH 90 PRINT:PRINTF$"MATERIALS:
       "G$"0 0 0 0 0"SPC(13)"0
      :00"
AM 100 PRINT:PRINTSPC(9)F$N$I$
       I$I$K$:PRINT"PROJECT: "
       H$G$"000"F$H$
MP 110 PRINTSPC(9)L$I$I$I$M$:P
       RINT:PRINT:PRINTSPC(X)B
       $N$I$I$I$I$K$
SB 120 PRINTG$"0 ";:FORI=.TO6:
       PRINT"+ 0 ";:NEXT:PRINT
       CHR$(146)B$"= "H$G$"000
       0"B$H$
XA 130 FORI=.TO14:PRINTCHR$(16
       3)" ";:NEXT:PRINTSPC(2)
       L$I$I$I$I$M$:FORI=.TO3:
       PRINT
RR 140 NEXT:PRINTSPC(24)"ROUND
        "G$"0"B$:PRINT:PRINTSP
       C(24)"PLAYER 1: "G$"000
       0"B$
SM 150 PRINTSPC(24)"PLAYER 2:
       {SPACE}"G$"0000";
EE 160 POKEQ,18:PRINT:PRINT"NU
       MBER OF PLAYERS? ";
XC 170 GETP$:IFP$=""THEN170
DE 180 T=ASC(P$)-48:IF(T<>1AND
       T<>2)ORP$=""THEN170
MQ 190 PRINT:PRINT:PRINT"1 - B
       EGINNER":PRINT"2 - INTE
       RMEDIATE":PRINT"3 - ADV
       ANCED"
BC 200 POKEQ,18:PRINT:PRINT"LE
       VEL OF DIFFICULTY? ";
XP 210 GETD$:IFD$<>"1"ANDD$<>"
       2"ANDD$<>"3"THEN210
CF 220 GOSUB610:D=1:L(1)=.:L(2
       )=.:U=.:M=3-(D$<"3")-(D
       $<"2"):LE=4-VAL(D$)
BK 230 POKEQ,20:PRINT:PRINTSPC
       (29)D:R$="000000":K=98+
       (D$>"1")+(D$>"2")
AJ 240 POKEQ,6:PRINT:PRINTSPC(
       X)K-95U$":00":N=1:G=.:F
       ORI=1TO5:M(I)=.:NEXT
FA 250 R=INT(RND(.)*9)+1:IFR=M
       (1)ORR=M(2)ORR=M(3)ORR=
       M(4)ORR=M(5)THEN250
SA 260 FORI=NTO5:M(I)=R:NEXT:P
       OKEQ,6:PRINT:IFN<MTHENN
       =N+1:GOTO250
MS 270 POKEQ,6:PRINT:PRINTSPC(
       11)W$W$" ":POKEQ,6:PRIN
       T:PRINTSPC(10);
FQ 280 N=1:O=1:G=.:T(1)=.:FORI
       =1TOM
DC 290 PRINTM(I);:NEXT:V=INT(R
       ND(.)*900)+100:POKEQ,9:
       PRINT:PRINTSPC(9)V;:POK
       EQ,9
JP 300 PRINT:PRINTSPC(9)F$Q$G$
DX 310 POKEQ,18:PRINT:PRINT"PL
       AYER"P:PRINT:PRINT"PRES
       S ANY KEY TO"
HE 320 PRINT"BEGIN CONSTRUCTIO
       N!":POKEQ,14:PRINT:FORI
       =.TO28:PRINTO$;:NEXT
PR 330 POKEQ,14:PRINT:POKECC,3
       3:PRINTW$
CK 340 WAITY,1:GETA$:POKEQ,20:
       PRINT:FORI=.TO15:PRINTO
       $;
EJ 350 POKEC0+I,7:NEXT:TI$="00
       0000"
HA 360 POKEQ,14:PRINT:PRINTSPC
       (33)W$:FORI=1TO8:B(I)=T
       (I):NEXT:L=G
BS 370 FORI=1TO7:B(I+1)=(O(I)=
       -3)*B(I+1)-(O(I)<>-3)*B
       (I+1):NEXT:M%=.:I=.:F=.
RB 380 I=I+1:IF(O(I)=-6ORO(I)=
       -1)ANDI<L/2THEN440
KA 390 H=M%:IFH+B(I)>9999THENE
       $="TOTAL TOO LARGE - PL
       EASE CORRECT!":F=1:GOTO
       450
QD 400 IFH+B(I)<.THENE$="NEGAT
       IVE TOTAL - PLEASE CORR
       ECT!":F=1:GOTO450
PH 410 M%=M%+B(I):IFI<L/2THEN3
       80
XG 420 POKEQ,14:PRINT:PRINTSPC
       (X)M%;
FK 430 POKEQ,14:PRINT:PRINTSPC
       (X)B$Q$G$:N%=M%:GOTO480
MP 440 B(I+1)=-(B(I)*B(I+1))*(
       O(I)=-6)-(B(I)/B(I+1))*
       (O(I)=-1):GOTO380
BA 450 POKEQ,16:PRINT:PRINTE$:
       POKEB,X:N=N+(N<15):G=G+
       (N=GANDG<>15):O=-O
QK 460 IFN=G+1ANDF=1THENPOKEQ,
       14:PRINT:POKEQ,14:PRINT
       :PRINTSPC(X)N%
PF 470 IFN=G+1ANDF=1THENF=.:PR
       INTCHR$(145)SPC(X)B$Q$G
       $:WAITY,1
FH 480 IFF=.THENPOKEQ,16:PRINT
       :FORI=.TOX:PRINTO$;:NEX
       T:PRINT
JS 490 B=SC+N*2:A=PEEK(B):POKE
       B,A+128:IFNOT((N=15)AND
       (O<.))THENO=-O
XE 500 GETC$:IFASC(MID$(TI$,4,
       1))<K-47THENGOSUB580:IF
       C$=""THEN500
HP 510 C$=C$+"?":C=ASC(C$)-48:
       IFASC(MID$(TI$,4,1))=K-
       47ORC=-35THEN620
RC 520 S=(N+1)/2:IF(C=-6ORC=-5
       ORC=-3ORC=-1)ANDO>.ANDN
       <16THENO(S)=C:GOTO570
KS 530 IF(C=M(1)ORC=M(2)ORC=M(
       3)ORC=M(4)ORC=M(5))ANDO
       <.ANDN<16THENT(S)=C:GOT
       O570
CX 540 IFC=-28ANDN=GANDN>.THEN
       POKEB,X:G=G-1:O=-O:T(S)
       =-T(S)*(N>1):GOTO360
BK 550 IFF=1ORNOT((C=-19AND(N<
       G+1)ANDN<15)OR(C=109AND
       N>1))THEN500
GS 560 IF(C=-19AND(N<G+1)ANDN<
       15)OR(C=109ANDN>1)THENP
```

```
      OKEB,A:N=N-(C=-19OR1):G
      OTO49Ø
GS 57Ø POKEB,C+48:G=G-(N>G):N=
      N-(N<15):GOTO36Ø
GX 58Ø POKEQ,6:PRINT:T$=TI$:IF
      T$=R$THENRETURN
PC 59Ø R$=T$:V$=CHR$(K-ASC(MID
      $(T$,4,1))):POKECC,33:I
      FV$=J$THENRETURN
CC 6ØØ PRINTV$":"CHR$(1Ø1-ASC(
      MID$(T$,5,1)))CHR$(1Ø5-
      ASC(MID$(T$,6,1))):RETU
      RN
DX 61Ø POKEQ,18:PRINT:FORI=.TO
      4:FORJ=.TO21:PRINTO$;:N
      EXT:PRINT:NEXT:RETURN
RX 62Ø POKEB,A:E=V-M%:E=E+2*E*
      (E<.):E=-E*(E<=Z)-Z*(E>
      Z):U=Z-E
GR 63Ø TR=LE*6Ø-(6Ø*VAL(MID$(T
      $,4,1))+VAL(RIGHT$(T$,2
      ))):U=INT((Z-E)*(4-LE)*
      TR/1Ø)
AB 64Ø L(P)=L(P)+U:POKEQ,21+P:
      PRINT:PRINTSPC(34)W$CHR
      $(145)
CX 65Ø PRINTSPC(33)L(P);:D=D+I
      NT(P/T):P=1-(T=2ANDP=1)
      :IFD<6THEN23Ø
PK 66Ø GOSUB61Ø:POKEQ,18:PRINT
      :PRINT"GOOD GAME!":PRIN
      T:PRINT"PLAY AGAIN? (Y/
      N) "
PE 67Ø GETC$:IFC$<>"Y"ANDC$<>"
      N"THEN67Ø
PX 68Ø PRINTJ$:IFC$="Y"THENRUN
```

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

Power BASIC:
Keyboard To Joystick Converter

Article on page 71.

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," which appears before the Program Listings.

Program 1: Keyboard To Joystick Converter

```
KX 1Ø FORI=1TO168:READA:X=X+A:
      NEXTI
BC 2Ø IFX<>23067THENPRINT"
      {CLR}TYPING ERROR IN DAT
      A LINES":STOP
CG 3Ø RESTORE:TT$=CHR$(142)+CH
      R$(8)+"{CLR}{RVS} KEYBOA
      RD TO JOYSTICK ":PRINTTT
      $
MK 4Ø FORI=828TO856:READA:POKE
      I,A:NEXT
XC 5Ø DATA12Ø,169,49,141,2Ø,3,
      169,234,141,21,3,88,96
HD 6Ø DATA165,1,72,41,254,133,
      1,32
PK 7Ø DATA27,191,1Ø4,133,1,76,
      126,234
KC 8Ø FORI=758TO767:READA:POKE
      I,A:NEXT
SC 9Ø DATA198,1,32,27,191,23Ø,
      1,76,126,234
PX 1ØØ PRINT"{DOWN}(IF PLAN A
      {SPACE}DOESN'T WORK, TR
      Y PLAN B){2 UP}"
DM 11Ø PRINT"PLAN A OR B
      {2 SPACES}A{3 LEFT}";
QD 12Ø INPUTP$:I=758:IFP$="A"T
      HENI=841
DC 13Ø POKE835,I/256:POKE83Ø,I
      -PEEK(835)*256
HA 14Ø FORI=ØTO73:POKEI+48923,
      PEEK(I+59953):NEXT
HS 15Ø FORI=48997TO49125:READA
      :POKEI,A:NEXT
JQ 16Ø DATA169,255,133,2Ø3,141
      ,245,191,169,129
AG 17Ø DATA133,245,169,235,133
      ,246,162,Ø,142,141
RG 18Ø DATA2,142,2,22Ø,16Ø,1,1
      69,16,32,186,191
XS 19Ø DATA232,74,144,249,136,
      16,244,14Ø
PS 2ØØ DATA2,22Ø,173,245,191,2
      Ø1,16,24Ø,35,165
ED 21Ø DATA2Ø3,162,3,157,23Ø,1
      91,189,23Ø,191
EF 22Ø DATA2Ø1,255,2Ø8,6,2Ø2,1
      6,246,76
EG 23Ø DATA135,234,133,2Ø3,162
      ,Ø,189,231
HF 24Ø DATA191,157,23Ø,191,232
      ,224,3,144
DQ 25Ø DATA245,76,221,234,72,5
      7
QR 26Ø DATAØ,22Ø,2Ø8,15,189,24
      6,191,2Ø1
AE 27Ø DATA65,144,1Ø,41,63,13,
      141,2
QM 28Ø DATA141,141,2,1Ø4,96,19
      7,2Ø3,144
XQ 29Ø DATA7,133,2Ø3,1Ø4,141,2
      45,191,96,72,165,2Ø3
DQ 3ØØ DATA2Ø1,255,1Ø4,176,241
      ,144,233
GF 31Ø FORI=49126TO49141:POKEI
      ,255:NEXT:FORA=ØTO4:REA
      DA$(A):NEXT
HJ 32Ø DATAUP,DOWN,LEFT,RIGHT,
      FIRE
EJ 33Ø FORF=1TO7:READF$(F):NEX
      T
GX 34Ø DATASHIFT,LOGO,SHIFT+LO
      GO,CTRL,SHIFT+CTRL,LOGO
      +CTRL,SHIFT+LOGO+CTRL
FA 35Ø POKE8Ø8,239:PRINTTT$:FO
      RI=ØTO1:PRINT"JOYSTICK
      {SPACE}PORT";I+1
DJ 36Ø FORA=ØTO4:PRINT"PRESS K
      EY FOR ";A$(A);"? ";
QJ 37Ø K=PEEK(197):F=PEEK(653)
      :IFQTHENIFK<64ORFTHENQ=
      Ø:GOTO4ØØ
CG 38Ø IFK=64ANDF=ØTHENQ=1
ES 39Ø GOTO37Ø
KR 4ØØ IFK=64THENK=K+F:A$=F$(F
      ):POKE198,Ø
GA 41Ø POKE49142+I*5+4-A,K
JR 42Ø GETG$:IFG$>""THENA$=G$:
      GOTO42Ø
QB 43Ø IFA$=" "THENA$="SPACE"
CG 44Ø IFA$=CHR$(13)THENA$="RE
      TURN"
MS 45Ø POKE216,1:PRINTA$:NEXTA
      :PRINT:NEXTI:POKE198,Ø
QG 46Ø PRINT"MAXIMUM BREAK LEN
      GTH? 3{LEFT}";:I=3
HP 47Ø GETA$:IFA$=CHR$(13)THEN
      PRINT:PRINT:GOTO5ØØ
JG 48Ø IFA$<"Ø"ORA$>"9"THEN47Ø
DS 49Ø I=VAL(A$):PRINTA$"
      {LEFT}";:GOTO47Ø
RF 5ØØ POKE8Ø8,237:POKE49Ø47,I
      :POKE49Ø76,I
QA 51Ø PRINT"{2 DOWN}ARE YOUR
      {SPACE}CHOICES SATISFAC
      TORY? (Y/N)"
JD 52Ø GETA$:IFA$="N"THEN35Ø
XB 53Ø IFA$="Y"THENSYS828:PRIN
      TCHR$(9);:NEW
EF 54Ø GOTO52Ø
```

Program 2: Worm (Demo)

```
HH 1ØØ POKE53281,6:PRINT"{CLR}
      {CYN}"TAB(13)"*** HUNGR
      Y LIKE A WORM ***":A=RN
      D(Ø)
HB 11Ø POKE5328Ø,Ø:POKE53281,Ø
      :FORI=ØTO19:POKE1Ø83-I,
      16Ø:POKE1Ø84+I,16Ø:NEXT
      I
FR 12Ø FORI=ØTO21:POKE1Ø4+I*4
      Ø,16Ø:POKE1143+I*4Ø,16Ø
      :NEXTI
FA 13Ø FORI=ØTO19:POKE1984+I,1
      6Ø:POKE2Ø23-I,16Ø:NEXTI
CP 14Ø DIMS(999):WH=292:WT=WH:
      D=1:POKEWH+1Ø24,81:S(WH
      )=D:GOSUB32Ø:GOSUB35Ø
EC 15Ø GETA$:D1=D
CG 16Ø IFA$="J"THEND=-1
AC 17Ø IFA$="K"THEND=1
HG 18Ø IFA$="I"THEND=-4Ø
BR 19Ø IFA$="M"THEND=4Ø
DQ 2ØØ IFD=-D1THEND=D1
BQ 21Ø S(WH)=D:WH=WH+D
AK 22Ø IFPEEK(WH+1Ø24)=65THENS
      C=SC+1Ø:GOSUB35Ø:GOSUB3
      2Ø:GOSUB32Ø:L=5:GOTO24Ø
CA 23Ø IFPEEK(WH+1Ø24)<>32THEN
      27Ø
PG 24Ø POKEWH+1Ø24,81:IFLTHENL
      =L-1:GOTO26Ø
HH 25Ø POKEWT+1Ø24,32:WT=WT+S(
      WT)
HM 26Ø FORT=1TO25:NEXTT:GOTO15
      Ø
XF 27Ø P=PEEK(WH+1Ø24):POKEWH+
      1Ø24,86:PRINT:PRINT:PRI
      NTTAB(2)CHR$(18)"YOU RA
      N ";
HC 28Ø IFP=81THENPRINT"OVER YO
      URSELF"
SX 29Ø IFP=16ØTHENPRINT"INTO A
       WALL"
KK 3ØØ PRINT:PRINTTAB(2)CHR$(1
      8)"GAME OVER":END
KA 31Ø REM *** GROW MUSHROOMS
      {SPACE}***
MK 32Ø R=INT(RND(1)*96Ø)+1Ø64:
      IFPEEK(R)<>32THEN32Ø
FA 33Ø POKER,65:RETURN
CE 34Ø REM *** PRINT SCORE ***
RF 35Ø PRINTCHR$(19)"SCORE: "R
      IGHT$("ØØØØ"+MID$(STR$(
      SC),2),5):RETURN
```

Survivor

See instructions in article on page 36 before typing in.

Program 1: Survivor—BASIC Loader

```
AS 1ØØ IFA=ØTHENA=1:PRINT"
      {CLR}{9 DOWN}{BLK}"SPC(
      14)"LOADING ML":LOAD"SU
      RVIVOR 2",8,1
```

```
EG 110 POKE56,32:POKE55,0:CLR
FC 120 PRINT"{CLR}":Z=2:BC=532
      80:BK=53281:C$(1)="{2}"
      :C$(2)="{1}":C$(3)="
      {RED}":A$=CHR$(148)
MM 130 T1=0
BX 140 IFA$=CHR$(129)THENA$=CH
      R$(28):GOTO160
AE 150 A$=CHR$(129)
XB 160 PRINTA$:PRINT"{HOME}
      {6 DOWN}{3 SPACES}";
QG 170 POKEBC,0:POKEBK,0:U$="
      {29 SPACES}":M$="{RVS}
      {K}{OFF}{K}{RVS}{K}
      {OFF}{K}"
CC 180 PRINT"{RVS}{4 SPACES}
      {OFF}"SPC(35)"{RVS}
      {2 SPACES}{OFF}
      {2 SPACES}{RVS}
      {2 SPACES}{OFF}"SPC(34)
      "{RVS}{2 SPACES}{OFF}
      {5 SPACES}"M$U$" {RVS}
      {4 SPACES}{OFF}
      {2 SPACES}"M$"{RVS}{K}
      {D}{F}";
RF 190 PRINT"{OFF}{F}"U$"{RVS}
      {2 SPACES}{OFF} "M$"
      {RVS}{K}{C}{V}{OFF}{V}"
      M$SPC(21)"{RVS}
      {2 SPACES}{OFF}
      {2 SPACES}{RVS}
      {2 SPACES}{OFF}
      {2 SPACES}{RVS}{2 I}
      {OFF} {RVS}{K}{D}{C}
      {OFF} "M$" {RVS}{F}{D}
      {OFF}";
DE 200 PRINTSPC(19)"{RVS}
      {4 SPACES}{OFF}
      {6 SPACES}{C}{V}{C}{V}
      {C}{RVS}{C}{V}{OFF}{V}
      {SPACE}{RVS}{K}{OFF}{K}
       "M$U$"{C}{V}{2 SPACES}
      {RVS}{K}{OFF}{K} "M$"
      {D}{RVS}{D}{F}{OFF}{F}"
      U$"{RVS}{2 I}";
XK 210 PRINT"{OFF} {C}{RVS}{C}
      {V}{OFF}{V}{RVS}{K}
      {OFF}{K}{RVS}{K}{OFF}
      {K}{RVS}{K}{D}{F}{OFF}
      {F}"U$"{C}{V} "M$"{RVS}
      {K}{C}{V}{OFF}{V}"SPC(3
      3)"{RVS}{2 I}{OFF}
      {RVS}{K}{D}{C}{OFF}
      {DOWN}{3 LEFT}{C}{V}{C}
      {V}"
QF 220 PRINTSPC(4)"{3 DOWN} PR
      ESS FIRE BUTTON TO PLAY
      "
FB 230 IF((PEEK(56320)ANDPEEK(
      56321))AND16)<>16THENPO
      KEBC,12:GOTO250
AB 240 GOTO140
JP 250 GOSUB350:PRINT"{CLR}";:
      L$=C$+"{RVS}{7 SPACES}
      {OFF}":PRINTL$SPC(33);:
      FORX=1TO5:FORZ=1TO3
KM 260 GOSUB350:PRINTL$"{BLK}
      {SPACE}{RVS}";
MJ 270 PRINTC$(Z)"{3 SPACES}
      {OFF}{BLK} {RVS}"C$(Z)"
      {3 SPACES}{OFF}{BLK}
      {RVS}"C$(Z)"{3 SPACES}
      {OFF}{BLK} {RVS}"C$(Z)"
      {3 SPACES}{OFF}{BLK}
      {RVS}"C$(Z);
SG 280 PRINT"{3 SPACES}{OFF}
      {BLK} {RVS}"C$(Z)"
      {3 SPACES}{OFF}{BLK}
      {RVS}"C$(Z)"{3 SPACES}
      {OFF}{BLK} {RVS}"C$(Z)"
      {3 SPACES}{OFF}{BLK} ";
      :NEXTZ
KK 290 IFMTTHENGOSUB350:PRINTL
      $"{BLK}{32 SPACES}
      {LEFT}"A$" {HOME}";:GOT
      O320
KC 300 GOSUB350
EK 310 PRINTL$"{OFF}{BLK}
      {33 SPACES}";:NEXTX:MT=
      1:FORZ=1TO3:GOTO260
QX 320 C$="{YEL}":GOSUB340:PRI
      NT"{3 DOWN}":C$="{CYN}"
      :GOSUB340
AH 330 SYS10240:GOTO360
AD 340 PRINT"{2 DOWN}{RVS}"C$"
      LIVES{2 DOWN}{3 LEFT}
      {5}5"C$"{2 DOWN}
      {3 LEFT}SHOTS{5}
      {3 DOWN}";:RETURN
XB 350 C$="{5}":RETURN
QM 360 PRINT"{HOME}{12 DOWN}"S
      PC(19)"{WHT}{OFF}GAME O
      VER"
KH 370 IF(PEEK(870)-176)THENT2
      =8+(PEEK(878)=0):GOTO39
      0
KS 380 T2=4+(PEEK(878)=0)
RD 390 FORI=1TO9:POKEBK,T2:FOR
      J=1TO50:NEXTJ:POKEBK,T1
      :FORJ=1TO50:NEXTJ,I
HB 400 PRINT"{7 DOWN}"SPC(8)"P
      RESS FIRE BUTTON TO PLA
      Y AGAIN{HOME}"
PX 410 IF((PEEK(56320)ANDPEEK(
      56321))AND16)<>16THEN33
      0
DQ 420 GOTO410
```

Program 2: Survivor—Machine Language

```
2800:A9 00 8D 74 03 A2 00 B5 76
2808:00 9D BB 33 CA D0 F8 20 16
2810:DF 28 A5 A5 8D 6F 03 20 B9
2818:C6 2F A9 B5 8D 66 03 8D C1
2820:67 03 AD 6E 03 D0 1F A0 BB
2828:17 99 00 D4 88 10 FA 8D BF
2830:0C D4 A9 05 8D 03 D4 A9 0D
2838:0F 8D 18 D4 A9 81 8D 0F 41
2840:D4 8D 12 D4 D0 12 A9 2F 3F
2848:8D 11 FF A9 03 8D 10 FF AC
2850:AD 12 FF 09 03 8D 12 FF FE
2858:20 71 2C 20 99 30 AD 74 F9
2860:03 D0 71 A9 0A 8D 64 03 81
2868:8D 65 03 20 99 30 20 1D 26
2870:29 20 51 29 20 E1 FF F0 93
2878:FB 20 F1 2D 20 95 2E 20 B3
2880:58 30 20 D9 2B AD 6D 03 98
2888:D0 CE CE 3F 03 D0 09 AD DD
2890:40 03 8D 3F 03 20 06 2A 36
2898:CE 54 03 D0 0D A2 01 BD 85
28A0:50 03 F0 06 DE 50 03 CA 61
28A8:10 F5 CE 46 03 D0 0C AD DD
28B0:47 03 8D 46 03 20 6C 2B 18
28B8:20 99 30 CE 4D 03 D0 0C 96
28C0:AD 4E 03 8D 4D 03 20 98 04
28C8:2C 20 4A 2D A2 00 CA D0 CE
28D0:FD 4C 74 28 A2 00 BD BB 90
28D8:33 95 00 CA D0 F8 60 AD AD
28E0:00 03 C9 8B D0 17 A9 07 21
28E8:85 02 A9 04 85 03 A9 00 7D
28F0:85 04 A9 D4 85 05 A9 00 1B
28F8:8D 6E 03 F0 13 A9 07 85 ED
2900:02 A9 0C 85 03 A9 00 85 DB
2908:04 A9 FC 85 05 8D 6E 03 FC
2910:78 A9 4C 8D 14 03 A9 31 9C
2918:8D 15 03 58 60 A9 B3 8D FA
2920:3E 03 A5 02 18 69 DB 85 CA
2928:F9 A5 03 69 01 85 FA A0 8C
2930:00 AD 3E 03 91 F9 A2 00 9F
2938:A0 00 EA EA 88 D0 FB CA 31
2940:D0 F8 CE 3E 03 AD 3E 03 45
2948:C9 AF D0 D6 A9 A0 91 F9 DF
2950:60 A5 02 85 FC 18 69 E0 D0
2958:85 FE A5 03 85 FD 69 03 0C
2960:85 FF A0 00 8C 43 03 8C 8D
2968:50 03 8C 51 03 8C 5E 03 54
2970:AD F4 31 91 FC AD F5 31 D1
2978:91 FE A9 1E 8D 40 03 8D 6B
2980:3F 03 A9 46 8D 4D 03 8D 02
2988:4E 03 A9 20 8D 3C 03 8D EA
2990:3D 03 20 FB 29 A9 14 8D AB
2998:47 03 8D 46 03 A5 02 18 30
29A0:69 F0 8D 4B 03 A5 03 69 68
29A8:01 8D 4C 03 A9 5A 8D 57 C1
29B0:03 8D 58 03 A2 03 8A 9D F6
29B8:93 33 AD 4B 03 9D 75 33 B8
29C0:AD 4C 03 9D 7F 33 A9 00 53
29C8:9D A7 33 8D 62 03 8D 61 AE
29D0:03 8D 59 03 8D 70 03 8D 25
29D8:72 03 8D 6B 03 8D 6D 03 B9
29E0:CA 10 D3 A5 02 8D 55 03 65
29E8:A5 03 8D 56 03 A9 0F 8D 50
29F0:73 03 8D 6C 03 A9 0A 8D 96
29F8:05 D4 60 A2 1D A9 00 9D 66
2A00:DF 32 CA 10 FA 60 A2 01 CA
2A08:AD 6C 03 C9 0F F0 01 60 E9
2A10:BD 52 03 49 80 9D 52 03 EE
2A18:10 08 BD 50 03 D0 03 4C E0
2A20:47 2B 8A 0A A8 B9 FC 00 FA
2A28:85 F7 B9 FD 00 85 F8 20 7C
2A30:23 31 4A B0 11 48 A9 28 DB
2A38:20 4E 2B A9 D8 8D 41 03 B2
2A40:A9 FF 8D 42 03 68 4A B0 3E
2A48:0F 48 A9 28 8D 41 03 20 85
2A50:60 2B A9 00 8D 42 03 68 B8
2A58:4A B0 0F 48 A9 01 20 4E 44
2A60:2B A9 FF 8D 41 03 8D 42 01
2A68:03 68 4A B0 0F 48 A9 01 9A
2A70:8D 41 03 20 60 2B A9 00 41
2A78:8D 42 03 68 4A B0 78 48 59
2A80:BD 44 03 F0 04 68 4C FC 8B
2A88:2A BD 64 03 D0 04 68 4C D1
2A90:F7 2A DE 64 03 EE 43 03 EA
2A98:AD 43 03 C9 1E D0 05 A9 79
2AA0:00 8D 43 03 A8 A5 F7 18 D4
2AA8:6D 41 03 99 C1 32 85 F9 D9
2AB0:A5 F8 6D 42 03 99 DF 32 58
2AB8:85 FA AD 41 03 99 FD 32 05
2AC0:BD F4 31 AD 42 03 99 1B 9E
2AC8:33 68 FE 44 03 AD 6E 03 A3
2AD0:D0 1B A9 80 8D 0B D4 A9 7D
2AD8:81 8D 0B D4 A9 40 8D 04 6D
2AE0:D4 A9 41 8D 04 D4 A9 14 E5
2AE8:8D 70 03 D0 0F A9 19 8D 6C
2AF0:70 03 A9 5F 8D 11 FF A9 C3
2AF8:00 9D 44 03 A0 00 B1 F7 CD
2B00:C9 80 B0 43 A5 F8 38 E5 0D
2B08:03 30 3C C9 04 B0 38 C9 2D
2B10:03 90 06 A5 F7 C9 E8 B0 90
2B18:2E 8E 3E 03 8A 0A AA 20 13
2B20:D9 2B A9 20 81 FC 8A A8 23
2B28:AE 3E 03 A5 F7 99 FC 00 40
2B30:A5 F8 99 FD 00 A0 00 B1 DE
2B38:F7 9D 3C 03 20 D9 2B BD 26
2B40:F4 31 91 F7 20 22 30 CA C3
2B48:30 03 4C 10 2A 60 8D 3E 2E
2B50:03 A5 F7 38 ED 3E 03 85 08
2B58:F7 A5 F8 E9 00 85 F8 60 3A
2B60:18 65 F7 85 F7 A5 F8 69 25
2B68:00 85 F8 60 A2 1D AD 6C 96
2B70:03 C9 0F F0 01 60 BD DF 90
2B78:32 F0 5A 85 F8 BD C1 32 3C
2B80:85 F7 A0 00 B1 F7 C9 80 2D
2B88:B0 3D 48 A9 20 91 F7 68 C9
2B90:C9 4B D0 09 A9 4D 91 F7 E6
2B98:20 22 30 D0 2A BD C1 32 98
2BA0:18 7D FD 32 9D C1 32 85 23
2BA8:F7 BD DF 32 7D 1B 33 9D E5
2BB0:DF 32 85 F8 38 E5 03 30 53
2BB8:0E C9 04 B0 0A B1 F7 C9 E4
2BC0:4B F0 D1 C9 80 90 07 A9 CD
2BC8:00 9D DF 32 F0 07 A9 4D E9
2BD0:91 F7 20 22 30 CA 10 9E 7F
2BD8:60 8A 48 AD 6C 03 C9 0F F7
2BE0:D0 42 A2 02 A1 FC C9 48 81
2BE8:90 33 C9 4E B0 2F AD 6E 7E
2BF0:03 D0 16 A9 80 8D 04 D4 71
2BF8:A9 81 8D 04 D4 A9 0F 8D 6F
```

```
2C00:72 03 A9 0F 8D 05 D4 D0 73
2C08:05 A9 4F 8D 72 03 8E 6C 39
2C10:03 A9 4E 8D 6A 03 81 FC 56
2C18:A9 00 8D 6B 03 CA CA 10 96
2C20:C3 68 AA 60 CE 6B 03 D0 CA
2C28:3B AD 6A 03 AE 6C 03 81 B5
2C30:FC B5 FC 85 F7 B5 FD 85 84
2C38:F8 8A 48 18 69 40 20 22 E8
2C40:30 68 AA EE 6A 03 AD 6A 34
2C48:03 C9 51 D0 17 A9 01 8D BA
2C50:6D 03 8A 4A AA DE 66 03 B6
2C58:BD 66 03 48 20 99 30 68 3E
2C60:C9 B0 F0 03 68 AA 60 20 E6
2C68:71 2C 68 A9 01 8D 74 03 56
2C70:60 A5 02 85 F7 A5 03 85 DC
2C78:F8 A2 03 A0 00 B1 F7 30 47
2C80:04 A9 20 91 F7 C8 E0 00 07
2C88:D0 04 C0 E1 F0 09 C0 00 AD
2C90:D0 EB E6 F8 CA 10 E6 60 7D
2C98:A2 03 AD 6C 03 C9 0F F0 CD
2CA0:01 60 BD 75 33 85 F7 BD FD
2CA8:7F 33 85 F8 A0 00 B1 F7 2E
2CB0:A0 01 A0 00 8C 3E 03 C9 DA
2CB8:4D D0 03 EE 3E 03 A9 20 AC
2CC0:91 F7 AD 3E 03 F0 17 BD 41
2CC8:FE 31 9D 93 33 AD 4B 03 C3
2CD0:9D 75 33 AD 4C 03 9D 7F BF
2CD8:33 A9 20 4C 16 2D BD 93 72
2CE0:33 8D 4A 03 20 0D 31 29 70
2CE8:03 49 01 CD 4A 03 F0 05 57
2CF0:49 01 8D 4A 03 AD 4A 03 EA
2CF8:20 1D 2D B0 A5 A0 00 AD B6
2D00:4A 03 9D 93 33 A9 4B 91 95
2D08:F7 20 22 30 A5 F7 9D 75 6B
2D10:33 A5 F8 9D 7F 33 CA 30 F4
2D18:03 4C A2 2C 60 0A A8 B9 54
2D20:F6 31 18 65 F7 85 F7 B9 1B
2D28:F7 31 65 F8 85 F8 38 E5 6D
2D30:03 30 15 C9 04 B0 11 C9 26
2D38:03 90 06 A5 F7 C9 E8 B0 BC
2D40:07 A0 00 B1 F7 C9 80 60 A9
2D48:38 60 A2 03 A0 00 BD A7 83
2D50:33 F0 2A 85 F8 BD 9D 33 4B
2D58:85 F7 B1 F7 C9 20 D0 0D A6
2D60:BD 02 32 91 F7 20 22 30 2E
2D68:CE 4F 03 D0 7D DE B1 33 69
2D70:D0 78 A9 00 9D A7 33 A9 22
2D78:20 91 F7 D0 6D 20 0D 31 8A
2D80:C9 02 B0 66 20 0D 31 09 5D
2D88:80 9D B1 33 A5 02 85 F9 2E
2D90:A5 03 85 FA A0 04 20 0D 41
2D98:31 18 65 F9 85 F9 A5 FA 38
2DA0:69 00 85 FA 88 D0 EF B1 29
2DA8:F9 C9 20 D0 DF BD 02 32 AF
2DB0:48 91 F9 AD 6E 03 D0 16 E4
2DB8:A9 80 8D 04 D4 A9 81 8D D7
2DC0:04 D4 A9 0A 8D 05 D4 A9 FB
2DC8:1E 8D 70 03 D0 0A A9 1E F3
2DD0:8D 70 03 A9 4F 8D 11 FF DB
2DD8:A5 F9 9D 9D 33 85 F7 A5 57
2DE0:FA 9D A7 33 85 F8 68 20 49
2DE8:22 30 CA 30 03 4C 4E 2D CF
2DF0:60 A2 03 BD 9D 33 C5 FC A2
2DF8:D0 0C BD A7 33 C5 FD D0 6E
2E00:05 A0 00 4C 1D 2E BD 9D 86
2E08:33 C5 FE D0 0C BD A7 33 36
2E10:C5 FF D0 05 A0 01 20 1D 20
2E18:2E CA 10 D7 60 E0 00 D0 15
2E20:1B A5 FC 85 F9 A5 FD 85 53
2E28:FA A5 FE 85 FC A5 FF 85 A7
2E30:FD A5 F9 85 FE A5 FA 85 96
2E38:FF 4C 7B 2E E0 01 D0 06 AC
2E40:A9 14 99 50 03 60 E0 03 0D
2E48:D0 1E AD 5E 03 D0 0A A5 45
2E50:02 8D 9D 33 A5 03 8D A7 F3
2E58:33 98 49 01 0A 8D 5F 03 F5
2E60:A9 C8 8D 5E 03 4C 7B 2E C9
2E68:CE 68 03 D0 0D B9 64 03 CE
2E70:C9 0A F0 06 18 69 01 99 B4
2E78:64 03 60 BD A7 33 85 F8 BD
2E80:A9 00 9D A7 33 BD 9D 33 DE
2E88:85 F7 98 48 A0 00 A9 20 B5
2E90:91 F7 68 A8 60 CE 57 03 3B
2E98:F0 03 4C 71 2F AD 58 03 B2
2EA0:8D 57 03 AD 5E 03 F0 F2 A8
2EA8:CE 5E 03 D0 12 AD 55 03 66
2EB0:85 F9 AD 56 03 85 FA A0 2E
2EB8:00 A9 20 91 F9 D0 DB AD 15
2EC0:55 03 85 F9 38 E5 02 85 BB
2EC8:F7 AD 56 03 85 FA E5 03 6E
2ED0:85 F8 A0 00 A9 20 91 F9 2D
2ED8:20 72 2F 8E 5A 03 8C 5B 04
2EE0:03 AC 5F 03 B9 FC 00 38 FF
2EE8:E5 02 85 F7 B9 FD 00 E5 94
2EF0:03 85 F8 20 72 2F 8E 5C 1B
2EF8:03 8C 5D 03 20 0D 31 10 7D
2F00:22 AC 5D 03 CC 5B 03 F0 41
2F08:1A AC 5D 03 CC 5B 03 90 E4
2F10:09 A2 02 20 8B 2F 90 39 51
2F18:B0 23 A2 00 20 8B 2F 90 0A
2F20:30 B0 1A AE 5C 03 EC 5A 14
2F28:03 F0 DE 90 09 A2 04 20 24
2F30:8B 2F 90 1D B0 07 A2 06 F0
2F38:20 8B 2F 90 14 AE 59 03 89
2F40:20 8B 2F 90 0C 20 0D 31 AC
2F48:29 03 0A AA 20 8B 2F B0 26
2F50:F4 8E 59 03 A5 F9 8D 55 AD
2F58:03 A5 FA 8D 56 03 A0 00 D9
2F60:A9 48 48 91 F9 A5 F9 85 A7
2F68:F7 A5 FA 85 F8 68 20 22 AF
2F70:30 60 A0 FF C8 A5 F7 38 18
2F78:E9 28 85 F7 A5 F8 E9 00 EA
2F80:85 F8 10 F0 A5 F7 18 69 97
2F88:28 AA 60 8A 49 02 CD 59 A1
2F90:03 F0 31 98 48 AD 55 03 03
2F98:18 7D F6 31 85 F9 AD 56 1A
2FA0:03 7D F7 31 85 FA 38 E5 60
2FA8:03 30 17 C9 04 B0 13 C9 E6
2FB0:03 90 06 A5 F9 C9 E8 B0 49
2FB8:09 A0 00 B1 F9 C9 80 68 3F
2FC0:A8 60 68 A8 38 60 AD 6E 30
2FC8:03 F0 03 4C 0D 30 78 A9 CD
2FD0:33 85 01 20 E1 2F A9 37 A2
2FD8:85 01 58 A9 18 8D 18 D0 D7
2FE0:60 A2 07 A0 00 A9 00 85 2F
2FE8:F9 85 F7 A9 D0 85 FA A9 7B
2FF0:20 85 F8 B1 F9 91 F7 88 89
2FF8:D0 F9 E6 FA E6 F8 CA 10 8B
3000:F2 A0 9E B9 25 32 99 FF 96
3008:21 88 D0 F7 60 AD 12 FF 92
3010:29 FB 8D 12 FF AD 13 FF B3
3018:29 03 09 20 8D 13 FF 4C F5
3020:E1 2F 48 38 E9 40 8D 60 95
3028:03 98 48 8A 48 A5 F7 18 C2
3030:65 04 85 57 A5 F8 65 05 4B
3038:85 58 AD 6E 03 F0 09 AD A9
3040:60 03 18 69 10 AA D0 03 FA
3048:AE 60 03 BD 06 32 A0 00 8E
3050:91 57 68 AA 68 A8 68 60 1E
3058:CE 63 03 D0 3B EE 61 03 C1
3060:AD 61 03 C9 03 D0 05 A9 FB
3068:00 8D 61 03 0A 0A 0A AA BF
3070:A0 00 BD 66 32 99 40 22 D9
3078:E8 C8 C0 08 D0 F4 AD 62 30
3080:03 49 01 8D 62 03 0A 0A EA
3088:0A AA A0 00 BD 7E 32 99 92
3090:58 22 E8 C8 C0 08 D0 F4 0C
3098:60 A5 02 18 69 9B 85 F9 13
30A0:A5 03 69 00 85 FA A0 00 1B
30A8:AD 66 03 91 F9 A5 02 18 75
30B0:69 A3 85 F9 A5 03 69 02 0D
30B8:85 FA AD 67 03 91 F9 A5 BE
30C0:02 18 69 11 85 F9 A5 03 C8
30C8:69 01 85 FA AE 64 03 20 AB
30D0:E2 30 A5 02 18 69 19 85 A1
30D8:F9 A5 03 69 03 85 FA AE 69
30E0:65 03 8E 3E 03 A0 00 A2 A7
30E8:0E AD 3E 03 F0 06 30 04 B7
30F0:A9 AE D0 02 A9 A0 91 F9 F8
30F8:CE 3E 03 C8 C0 05 F0 04 3D
3100:C0 2D D0 05 98 18 69 23 93
3108:A8 CA 10 DD 60 AD 6E 03 EA
3110:D0 04 AD 1B D4 60 AD 6F 36
3118:03 0A 0A 38 6D 6F 03 8D FF
3120:6F 03 60 AD 6E 03 D0 04 07
3128:BD 00 DC 60 BD 48 31 8D 0A
3130:08 FF EA EA EA AD 08 FF C0
3138:8D 3E 03 3D 4A 31 08 AD F9
3140:3E 03 28 D0 02 29 EF 60 89
3148:FA FD 40 80 AD 6E 03 D0 B5
3150:2D AD 72 03 D0 11 AD 70 C9
3158:03 F0 03 CE 70 03 8D 01 71
3160:D4 8D 08 D4 4C 7B 31 CE 60
3168:73 03 AD 73 03 D0 06 CE 68
3170:72 03 AD 72 03 8D 73 03 E1
3178:8D 01 D4 4C 31 EA AD 72 44
3180:03 D0 1E AD 70 03 F0 05 AD
3188:CE 70 03 D0 0A AD 11 FF 05
3190:29 0F F0 03 CE 11 FF 0A 5E
3198:8D 0F FF 8D 0E FF 4C C5 2D
31A0:31 CE 73 03 AD 73 03 D0 FF
31A8:19 CE 72 03 AD 72 03 C9 D0
31B0:40 D0 05 A9 00 8D 72 03 C0
31B8:8D 11 FF 29 0F 09 10 8D 03
31C0:73 03 8D 0F FF 4C 0E CE 5C
31C8:1C 92 47 41 4D 45 20 4F E9
31D0:56 45 52 11 11 11 11 9D 97
31D8:9D 9D 9D 9D 9D 9D 9D 9D 3B
31E0:9D 9D 9D 50 52 45 53 53 D3
31E8:20 46 49 52 45 42 55 54 6D
31F0:54 4F 4E 00 41 42 D8 FF DF
31F8:28 00 01 00 FF FF 00 01 90
3200:02 03 44 45 46 47 07 07 67
3208:03 00 01 01 01 01 08 08 42
3210:08 04 04 05 05 01 47 47 4C
3218:43 00 71 71 71 71 48 48 8D
3220:48 44 44 45 45 71 00 00 86
3228:00 00 00 00 00 00 10 38 E4
3230:10 FE 10 38 10 00 10 38 BA
3238:10 FE 10 38 10 00 00 00 6A
3240:00 00 00 00 00 00 00 40 E4
3248:20 F2 24 4F 04 02 60 60 3C
3250:3E 10 F8 44 22 01 FF 81 D1
3258:81 99 99 81 81 FF 1C 3E B1
3260:4F 4F 47 22 1C 00 42 28 D8
3268:5A 25 A4 1A 45 28 10 45 A9
3270:9A 24 A6 58 25 48 08 40 20
3278:1A A4 24 58 21 08 49 1C F4
3280:1C 7F 1C 1C 49 00 49 1C 11
3288:5D 3E 5D 1C 49 00 00 00 E2
3290:00 18 18 00 00 00 10 28 46
3298:10 A4 10 28 10 00 00 28 5B
32A0:10 84 10 08 10 00 00 00 31
32A8:10 04 10 08 00 00 00 00 98
32B0:00 00 00 00 00 00 4D 59 09
32B8:4B 54 55 54 54 4C 45 4C 72
32C0:45 00 00 00 00 00 00 00 C7
```

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

128 Autoboot

Article on page 82.

Program 1: Create 128 Autoboot Sector

```
QF 10 REM ***{2 SPACES}PROGRAM
      CREATES A C-128 BOOT DI
      SK TO LOAD & RUN 'HI' FI
      LE ***
BD 20 DATA67,66,77,0,0,0,0,0,0
      ,120,32,132,255,234,234,
      234,234,234,169,195
HD 30 DATA141,238,255,169,8,14
      1,239,255,169,0,141,240,
      255,169,15,141,32,208,16
      9,6
RQ 40 DATA141,33,208,165,213,2
      01,72,208,1,96,169,72,14
      1,233,7,169,73,141,234,7
      ,169
QA 50 DATA1,162,8,160,255,32,1
      86,255,32,192,255,169,2,
      162,233,160,7
HR 60 DATA32,189,255,169,0,32,
```

```
      213,255,142,16,18,140,17
      ,18,32,231,255,169,4,133
      ,208
EQ 70 DATA169,82,141,74,3,169,
      85,141,75,3,169,78,141,7
      6,3,169,13,141,77,3,96,-
      1
DS 80 DIMA(121)
CA 90 FORMX=1TO121:READS:X=X+S
      :IFS=-1THEN110
EP 100 A(MX)=S:NEXT
CF 110 IFX<>14733THENPRINT"ERR
      OR IN DATA STATEMENTS."
      :STOP
GA 120 PRINT"{CLR}[63]{2 DOWN}E
      NTER YOUR PREFERRED COL
      OR CHOICES"
SF 130 PRINT"{2 DOWN}# OF SCRE
      EN COLOR";:INPUTA(40):P
      OKE53281,A(40)
EA 140 PRINT"{DOWN}# OF BORDER
       COLOR";:INPUTA(35):POK
      E53280,A(35)
KD 150 PRINT"{DOWN}ARE THESE A
      CCEPTABLE? (Y/N)";:INPU
      TA$:IFA$<>"Y"THEN120
DH 160 POKE53280,15:POKE53281,
      6:PRINT"{CLR}{WHT}"
DR 170 PRINT"{2 DOWN}{RVS}INSE
      RT A FORMATTED DISK TO
      {SPACE}RECEIVE DATA "
QF 180 PRINT"{RVS}{10 SPACES}T
      HEN PRESS [RETURN]
      {11 SPACES}"
FA 190 GETR$:IFR$<>CHR$(13)THE
      N190
FG 200 PRINT"{2 DOWN}WORKING..
      .":OPEN15,8,15:OPEN5,8,
      5,"#":PRINT#15,"B-P:5,0
      "
JM 210 FORD=1TOMX:PRINT#5,CHR$
      (A(D));:NEXTD:PRINT#5
GH 220 PRINT#15,"M-W:"CHR$(0)C
      HR$(5);1;CHR$(67)
KK 230 PRINT#15,"B-P:5,0":PRIN
      T#15,"U2:5,0,1,0":CLOSE
      5:CLOSE15
FH 240 OPEN15,8,15:INPUT#15,A$
      ,B$,C$,D$:CLOSE15
MC 250 IFA$="00"THENPRINT"BOOT
       TRACK WRITTEN":END
MB 260 PRINT"{RVS}AN ERROR HAS
       OCCURRED.":PRINTA$,B$,
      C$,D$
GH 270 END
```

Program 2: Menu

Note: Save as "HI" if you want the menu to boot.

```
HQ 10 REM *** AUTO-BOOT "HI" P
      ROGRAM ***
HP 20 PRINT"{CLR}{2 DOWN}"TAB(
      8)"[53]----------------
      ------"
CS 30 PRINTTAB(11)"{YEL}C-128
      {SPACE}SYSTEM MENU[53]":P
      RINTTAB(8)"-------------
      ----------[63]"
XS 40 DATA64 MODE - BASIC,64 M
      ODE - RUN FILE,BOOT CP/M
       DISK,128 MODE - BASIC
FF 50 DATA128 MODE - RUN FILE
MH 60 MX=5:FORD=1TOMX:READA$(D
      ):NEXT
JE 70 FORD=1TOMX:CHAR0,20-(LEN
      (A$(D))/2),5+D*2,A$(D),0
      :NEXT
FS 80 NW=1:CHAR0,0,20,"USE CUR
      SOR KEYS TO MOVE-RETURN
      {SPACE}TO SELECT"
EQ 90 PRINT"{WHT}":CHAR0,20-(L
      EN(A$(NW))/2),5+NW*2,A$(
      NW),1:PRINT"[63]"
HP 100 GETR$:IFR$="{DOWN}"THEN
      140
HB 110 IFR$="{UP}"THEN170
HQ 120 IFR$=CHR$(13)THEN200
EJ 130 GOTO100
DP 140 CHAR0,20-(LEN(A$(NW))/2
      ),5+NW*2,A$(NW),0
AE 150 NW=NW+1:IFNW=MX+1THENNW
      =1
BA 160 GOTO90
HF 170 CHAR0,20-(LEN(A$(NW))/2
      ),5+NW*2,A$(NW),0
CG 180 NW=NW-1:IFNW=.THENNW=MX
RD 190 GOTO90
QF 200 ONNWGOTO220,290,230,280
      ,260
PR 210 GOTO100
SF 220 GO64
SH 230 PRINT"{CLR}{DOWN}INSERT
       CP/M SYSTEM DISK, PRES
      S [RETURN]"
BH 240 GETR$:IFR$<>CHR$(13)THE
      N240
HR 250 BOOT
JA 260 PRINT"{CLR}{DOWN}FILENA
      ME";:INPUTF$
EC 270 RUN(F$)
RF 280 PRINT"{CLR}{DOWN}THIS D
      ISK CONTAINS:{DOWN}":DI
      RECTORY:NEW
MC 290 PRINT"{CLR}DOES FILE CO
      NTAIN AUTORUN CODE (Y/N
      )";
PK 300 INPUTF$:IFF$<>"Y"ANDF$<
      >"N"THEN290
CM 310 IFF$="Y"THEN440
DQ 320 BLOAD"AUTORUN.C64"
PA 330 PRINT"{CLR}{DOWN}FILE N
      AME";:INPUTF$
KA 340 IF LEN(F$)=.ORLEN(F$)>1
      6THEN290
ER 350 FORD=1TOLEN(F$):POKE328
      88+D,ASC(MID$(F$,D,1)):
      NEXT:POKE32888+D,42
ED 360 PRINT"IS THIS A SELF ST
      ARTING FILE? (Y/N)"
SG 370 GETKEYA$
RS 380 IF A$<>"N"THEN 430
MH 390 PRINT"{DOWN}ENTER FILE
      {SPACE}START ADDRESS";:
      INPUTF$
AJ 400 IFLEN(F$)=.ORLEN(F$)>5T
      HEN390
HQ 410 F$="SYS"+F$
SK 420 FORD=1TOLEN(F$):POKE329
      15+D,ASC(MID$(F$,D,1)):
      NEXT
HC 430 GO64
PP 440 PRINT"{2 DOWN}FILE NAME
      ";:INPUTF$
DQ 450 BLOAD(F$)
PF 460 GO64
```

Program 3: Create 64 Autorun Program

```
CK 10 REM ** CREATES AN AUTO R
      UN FILE WHEN YOU ENTER 6
      4 MODE **
ED 20 REM ** MUST BE RUN IN 12
      8 MODE. THE PBASIC PROGR
      AM MUST BE BASIC 2.0 ! *
      *
JA 30 DATA15,128,9,128,195,194
      ,205,56,48,104,168,104,1
      70
AK 40 DATA104,64,162,255,120,1
      54,216,142,22,208,32,163
      ,253,32,80
DP 50 DATA253,32,21,253,32,24,
      229,88,32,83,228,32,191,
      227,32
JX 60 DATA34,228,162,251,154,1
      69,113,133,43,169,128,13
      3,44,234,234
DQ 70 DATA169,0,133,45,169,0,1
      33,46
JK 80 DATA162,160,134,56,169
GE 90 DATA82,141,119,2,169,213
      ,141,120,2,169,13,141,12
      1,2,169
DQ 100 DATA3,133,198,162,128,1
       38,76,116,164,0,0,0,0,0
       ,0,51,47
FD 110 DATA49,53,22,49,46,49,0
       ,0,0,0,0
GR 120 PRINTCHR$(147):DN$=CHR$
       (17)
KA 130 PRINTDN$"ENTER FILENAME
       TO AUTORUN";:INPUTF1$
SF 140 OPEN2,8,2,F1$+",P,R":GO
       SUB300:CLOSE2
HH 150 PRINTCHR$(147)DN$DN$"PO
       KE45,113:POKE46,128:DLO
       AD"CHR$(34)F1$CHR$(34)
PJ 160 PRINTDN$DN$DN$DN$"PP=FR
       E(0):POKE45,1:POKE46,28
       :GOTO170{HOME}";
XJ 165 POKE208,2:POKE842,13:PO
       KE843,13:END
XA 170 PRINTCHR$(147)CHR$(17)"
       ENTER AUTORUN FILENAME:
       ";:INPUTF$
ER 180 PRINTCHR$(17)"["F$"] FI
       LESIZE:"118+(32397-PP)"
       BYTES"
QD 190 XX=(32397-PP)+32768+118
MQ 200 BANK0:RESTORE:FORD=.TO1
       12:READS:POKE32768+D,S:
       NEXT
GR 210 HI=INT(XX/256):LO=256*(
       XX/256-INT(XX/256))
QC 220 POKE32827,LO:POKE32831,
       HI
CC 230 BSAVE(F$),B0,P32768TOP(
       XX)
BQ 240 GOSUB300
MX 250 PRINTCHR$(17)"AUTORUN F
       ILE CREATED."
AK 260 PRINTCHR$(17)"CREATE AN
       OTHER? (Y/N)"
FX 270 GETKEYA$:IFA$="Y"THENRU
       N
XR 280 IF A$="N"THENPRINTCHR$(
       147):NEW
DH 290 GOTO270
KE 300 CLOSE15:OPEN15,8,15:INP
       UT#15,A$,B$:IFA$<>"00"T
       HENPRINT"{DOWN}{RIGHT}
       {RVS}ERROR :"B$:END
PK 310 RETURN
```

Program 4: 64 Loader Program

Enter and save from 64 mode.

```
KR 10 A$="................."
DQ 20 B$="RUN:....."
BS 30 PRINT"{CLR}{BLU}{2 DOWN}
      PO43,1:PO44,8:NEW":PRINT
      "{2 DOWN}LOAD"CHR$(34)A$
      CHR$(34)",8,1
EG 40 PRINT"{4 DOWN}?CHR$(5):"
      B$"{HOME}";
SX 50 POKE808,237:POKE809,246
MG 60 POKE198,3:POKE631,13:POK
      E632,13:POKE633,13:END
```

It Talks! It Recognizes! It Writes Music! and more . . .

THE AMAZING VOICE MASTER®

Speech and Music Processor

Your computer can talk in your own voice. Not a synthesizer but a true digitizer that **records** your natural voice quality—and in any language or accent. Words and phrases can be expanded without limit from disk.

And it will understand what you say. A real word recognizer for groups of 32 words or phrases with unlimited expansion from disk memory. **Now you can have a two way conversation with your computer!**

Easy for the beginning programmer with new BASIC commands. Machine language programs and memory locations for the more experienced software author.

Exciting Music Bonus lets you hum or whistle to write and perform. Notes literally scroll by **as you hum!** Your composition can be edited, saved, and printed out. You don't have to know one note from another in order to write and compose!

Based upon new technologies invented by **COVOX**. One low price buys you the **complete system**—even a voice controlled black-jack game! In addition, you will receive a subscription to COVOX NEWS, a periodic newsletter about speech technology, applications, new products, up-dates, and user contributions. **You will never find a better value for your computer.**

ONLY $89.95 includes all hardware and software.

For telephone demonstration or additional information, call **(503) 342-1271.** FREE audio demo tape and brochure available.

Available from your dealer or by mail. When ordering by mail add $4.00 shipping and handling ($10.00 for foreign, $6.00 Canada).

The Voice Master is available for the C64, C128, all Apple II's, and Atari 800, 800XL and 130XE. Specify model when ordering.

VISA MasterCard *For Faster Service on Credit Card Orders only:*

ORDER TOLL FREE 1-800-523-9230

COVOX INC. (503) 342-1271
675-D Conger Street, Eugene, OR 97402
Telex 706017 (AV ALARM UD)

ROBOT*LINK™

Program the Tomy Robots With Your Commodore 64!

COMPUTER MAGIC® TOMY®

VERBOT	$ 60.00	ROBOT*LINK	$40.00
OMNIBOT	$250.00	VERBOT BOWLING ..	$25.00
OMNIBOT 2000	$500.00	VERBOT BASKETBALL	$25.00

Send Check or Money Order to:

Computer Magic Ltd.
18 East Mall
Plainview, NY 11803
NY residents add 8¼% sales tax.

Tomy is a registered trademark of Tomy Corp. Computer Magic is a registered trademark of Computer Magic Ltd.
©1985 Computer Magic Ltd.

PRINT T-SHIRTS WITH ANY COMPUTER!

Underware™ makes custom T-Shirts in minutes!
With the Underware Ribbon your printer makes iron-on transfers of any screen image! Just print the image on plain paper using an Underware Ribbon, then iron it on to your own T-Shirt. Each ribbon makes 30-100 permanent and washable transfers.

Adding color is simple & inexpensive
With a set of Underware ColorPens you can add up to seven colors to any transfer made with an Underware Ribbon. Just color the plain paper transfer and iron it onto a T-Shirt.

A complete selection of Underware Products. . .
The ribbon is available for the NEC 8023, C. Itoh, Imagewriter, Okidata, Star Gemini, and Epson dot matrix printers.

For other printers — try our new Iron-on Coloring Kit with special carbon transfer paper. Please call for details.

- Underware Ribbon **$14.95**
- Underware ColorPens (set of 5) **$14.95**
- Underware Jumbo ColorPens (set of 7) **$19.95**
- Underware Iron-on Coloring Kit **$19.95**

UNDERWARE™ VISA MasterCard

Diversions, Inc. 408-245-7575
505 W. Olive Ave. #520, Sunnyvale, CA 94086

COMMODORE 64 & 128

Star micronics inc

THE POWER BEHIND THE PRINTED WORD.

SG-10	215	SD-15	449
SG-15	369	SR-10	Call
SD-10	339	SR-15	Call

SUPER PRINTER PACKAGES

SG-10 & G-Wiz 279

Legend 808 & G-Wiz 229

Panasonic 1091 & G-Wiz 308

Legend 1080 & G-Wiz 269

If Xetec Super Graphic is desired add $10 to package.

Super Printer packages have no added shipping or credit card surcharges when shipped in Continental USA.

PRINTERS

Legend 1080 209
Citoh 7500AP 219
Epson . . . . . Call
Juki 5510 389
Toshiba 1340 559
Legend 808 169
Panasonic 1091 . . . 245
Powertype 309

Buy the Print Shop for 27.95 with the purchase of any printer.

Printer Interfaces

Data Share 49 95
Cardco G I 44 95
G-Wiz 54 95
Xetec Super Graphic . . 69 95

MODEMS

Westridge AA/AD 49.95
Total Tele Modem 49 95
Mighty Mo 69 95
1660 Modem 49 95
Westridge 6470 169

PRINTER BUFFERS

U-Buff 16K 79.95

U-Buff 64K 99.95

While supplies last
Commodore 803 Printer 129

MONITORS

Sakata SC-100 . . . 169

Commodore 1802 169

Amdek 500 299

Teknika MJ-10 179

Teknika MJ-22 . . . . Call

Samsung/Green/Amber 79

C O M M O D O R E 6 4 S O F T W A R E

ACCESS

Beachhead-D 21 95
Beachhead II-D 24 95
Raid Over Moscow-D . . . 24 95
Mach V-Cart 21.95

ACTIVISION

Gamemaker 27.95
Computer Fireworks 23.95
Ghostbusters 24 95
Fast Tracks 23.95
Hacker 20 95
Computer Ltl. People . . . 23 95
Alter Ego 20.95
Cross Country Race 20 95
Borrowed Time 20.95

BATTERIES INCLUDED

Cal-Kit-D 34 95
Consultant-D 41 95
Home Pak-D 34.95
Paper Clip/Spellpak 54.95
Home Org. Series-D 16.95

BRODERBUND

Bank Street Writer-D . . . 34 95
Dr. Creep-D 20.95
Bungling Bay-D 20.95
Spelunker-D 20 95
Music Shop-D 29.95
Print Shop-D 28 95
Kareteka-D 20.95
Champ Loderunner-D . . . 23 95
Prt. Shop Graphics-D . . . 19.95
Print Shop Refill 16.95
Prt Shop Graph. II or III . . . 19.95
Prt. Shop Companion . . . 27.95

EPYX

Fast Load-Cart 24 95
Rescue on Fractalus-D . . . 24.95
World's Greatest Football-D 24 95
The Eidolon-D 24.95
Winter Games 24 95
Summer Games II-D 24 95
Koronis Rift-D 24 95
Ballblazer-D 24.95
Multiplan 64/128 . . . . . 44 95
Program/Tool Kit 29.95

INFOCOM

Deadline-D 29.95
Enchanter-D 24 95
Infidel-D 29 95
Planetfall-D 24 95
Sorcerer-D 29 95
Starcross-D 29 95
Suspended-D 29 95
Witness-D 29 95
Sea Stalker-D 24 95
Zork I, II or III-D 27 95
Wishbringer-D 29 95
Spellbreaker-D 29 95

MICROPROSE

Silent Service-D 23 95
Gunship-D 23 95
Accrojet-D 23 95
F-15 Strike Eagle-D 23 95
Decision in Eagle-D 27.95
Kennedy Approach-D . . . 23.95
Crusade in Europe-D 27.95

MINDSCAPE

Color Me 20 95
Crossword Magic 34 95
Perfect Score 49 95
Halley Project 27 95
Quake Minus One 20 95
Shadowfire 20 95
Lords of Midnight 20 95
Lusher Profile 27 95

AMIGA SOFTWARE

Hacker	29.95	7 Cities	29.95
Mindshadow	29.95	Skyfox	29.95
Mastertype	27.95	Marble Madness	29.95
VIP Professional	139.95	Return/Atlantis	29.95
Transylvania	27.95	Artic Fox	29.95
Crimson Crown	27.95	Fin. Cookbook	34.95
Archon	29.95	Deluxe Paint	59.95
One on One	29.95	Infocom	Call

C-128 COMPUTER
1571 DISK DRIVE
1670 MODEM
1902 RGBI MONITOR

Call for latest prices and availability

COMMODORE 128 SOFTWARE

Superbase 128 . . . 69.95
Consultant 41.95
Paper Clip/Spell . . 54.95
Swiftcalc w/Sideways 49.95
Wordwriter + Spell 49.95
Data Manager II . . 49.95
Fleet System II . . . 44.95
Mach V/128 . . . . . 34.95
King's Quest II 34.95
Gato 27.95
Home Pak 34.95

★ SUPER SPECIALS ★ SUPER SPECIALS ★ SUPER SPECIALS ★

SUPER SPECIALS

BUY ANY INFOCOM TITLE AND RECEIVE THE CORRESPONDING INVISICLUE ABSOLUTELY FREE*

SUPER SPECIALS

*** PRICES EFFECTIVE NOW THRU MARCH 31, 1986**

★ SUPER SPECIALS ★ SUPER SPECIALS ★ SUPER SPECIALS ★

MISCELLANEOUS

Reach/The Stars-D 29.95
Carriers At War-D 34 95
Superbase 64-D 47 95
Strip Poker-D 23 95
Slap Shot Hockey-D 14 95
Sargon III-D 34 95
Ultima II 37 95
Ultima III 37 95
Ultima IV-D 41 95
Microleague Baseball-D 29 95
Expedition Amazon-D . . . 23 95
Xyphus-D 27 95
Transylvania-D 23 95
Bounty Bob-D 23 95
Fleet System II-D 44.95
Newsroom-D 34 95
Paper Airplane Kit-D 23 95
Chem Lab 27 95
Superbowl Sunday-D . . . 23 95
Vip Terminal-D 29 95
Compuserve Starter Kit 21.95
Flight Simulator II-D 34 95
Batter-Up-D 29 95
Syncalc-D 34 95
Loderunner's Resc-D 20 95
Mindwheel-D 27 95
Voice Messenger-D 44.95
Main Event Boxing-D . . . 20 95
Crimson Crown-D 23 95
The Works-D 34 95
Perry Mason-D 22 95
Sherlock Holmes-D 23.95
Frank & Ernest ADV-D 23 95
Kobayashi Alternative-D 27 95
Brimstone-D 27 95
Keys to Typing-D 19.95
The Hobbit-D 23 95
Cave of Time-D 23 95
Escape-D 23 95
Golden Oldies-D 19 95
Europe Ablaze-D 33 95
Trio-D 49 95
Animation Station-D 49 95
Karate Champ-D 25 95
Essex-D 27 95
Kung Fu/Exploding Fist-D 20 95
Kung Fu Master-D 25 95
9 Princes of Amber-D . . . 22 95
Spy vs. Spy Vol. II-D 23 95
Maxi Golf-D 24 95
Internat'l Hockey-D 19 95
Fourth Protocol-D 23 95
Blazing Paddles-D 24 95
Mirage Word-D 34 95
Mirage Database 34 95
Welcome Aboard-D 19 95
Super Huey-D 14 95
Spell It-D 34 95
Math Blaster-D 34.95
Word Attack-D 34 95
Odesta Chess-D 49 95
Hardball 24 95
Dambusters 23 95
PSI Trading Co 24 95
Law of the West 24 95
Joe Theismann 24 95
Batter Up 24 95
Clip Art I 19 95
Championship Boxing . . 20 95
Sales Force 49 95
Superman 23 95
Bank Street Speller 49 95
Bank Street Mailer 34 95
Jet 29 95
Bank Street Filer 34 95

EST. 1982

ComputAbility™

P.O Box 17882, Milwaukee, WI 53217
ORDER LINES OPEN
Mon-Fri 11 a.m. - 7 p.m CST • Sat. 12 p.m. - 5 p.m. CST

To Order Call Toll Free

800-558-0003

For Technical Info, Order Inquiries, or for Wisc. Orders

414-351-2007

ORDERING INFORMATION: Please **specify system.** For fast delivery send cashier's check or money order. Personal and company checks allow 14 business days to clear. School P.O.'s welcome. **C.O.D. charges are $3.00.** In Continental U.S.A. include $3.00 for software orders, 4% shipping for hardware, minimum $4.00 Master Card and Visa orders please include card #, expiration date and signature WI residents please include 5% sales tax. HI, AK, FPO, APO, Puerto Rico and Canadian orders, please add 5% shipping, **minimum $5.00.** All other **foreign orders add 15% shipping, minimum $10.00.** All orders shipped outside the Continental U.S.A are shipped first class insured U.S mail. If foreign shipping charges exceed the minimum amount, you will be charged the additional amount to get your package to you quickly and safely. All goods are new and include factory warranty. Due to our low prices all sales are final. **All defective returns must have a return authorization number.** Please call (414) 351-2007 to obtain an R.A.# or your return will not be accepted Prices and availability subject to change without notice

SSI

50 Mission Crush-D 24 95
Cosmic Balance-D 24 95
Germany 1985-D 37 95
Professional Golf-D 24 95
Broadsides-D 24 95
Questron-D 24 95
Computer Qtrback-D 24 95
Field of Fire-D 24 95
Carrier Force-D 37 95
Breakthru Qtrback-D 37 95
Computer Ambush-D . . . 37 95
Kampfgruppe-D 37 95
Oper. Mkt Garden-D 32 95
Gemstone Warrior-D 21 95
Imperium Galact-D 24 95
Phantasie-D 24 95
Battalion Comm.-D 24 95
Fighter Command-D 37 95
Norway 1985-D 21 95
Wings of War D 24 95
Mech Brigade-D 37 95
Battle/Antietnam 32 95
Panzer Grenider 24 95
USAAF 37 95

SYNAPSE

Call for Items and Prices

TIMEWORKS

Business Systems-D 39 95
Word Writer/Spell-D 34 95
Swiftcalc w/Sideways 34 95
Data Manager II-D 34 95
Sideways-D 20 95
Evelyn Wood-D 34 95
Sylvia Porter-D 39.95

ELECTRONIC ARTS

Archon-D 19.95
Archon II-D 24 95
Mule-D 19 95
Realm/Imposs-D 19 95
Murder/Zinderneuf-D . . . 19 95
Music Construction-D . . . 19 95
Pinball Constr-D 19 95
Skyfox-D 24 95
One on One-D 24 95
Seven Cities of Gold-D . . 24 95
Mail Ord Monsters-D . . . 24 95
Racing Destruction-D . . . 24 95
Adventure Constr.-D 29 95
Fin Cookbook-D 29 95
Bard's Tale 27 95
Europe Ablaze 33.95
Touchdown Football 23 95

D-Disk T-Cassette Cart-Cartridge

No surcharge for MasterCard or Visa

ELECTRONIC ONE*

COMMODORE HARDWARE

C128	259.99
C64	129.99
1541 DISK DRIVE	169.99
1571 DISK DRIVE	239.99
1802 MONITOR	179.99
1902 MONITOR	249.99

PRINTERS - INTERFACES

STAR SG10	219.99
PANASONIC 1091	219.99
EPSON LX80	219.99
COMMODORE 803	99.99
COMMODORE 802	179.99
CONNECTION INTERFACE	54.99
CARDCO G-WIZ	46.99

COMPUTER ACCESSORIES

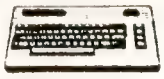
TOTAL COMM. MODEM	29.99
COMPUSERVE STARTER	14.99
SAKATA 13" COLOR	139.99
MAXELL DISK (S/S D/D)	9.99
1670 MODEM	159.99
FLIP FILE (HOLDS 50 DISK)	7.99
WICO BOSS - JOY STICK	9.99
WICO BAT	15.99

SPECIAL

PRINT SHOP

$23.99

commodore



THE LOWEST PRICES THE BEST SERVICE

ELECTRONIC ONE CALL (614) 864-9994
P.O. Box 13428 • Columbus, Oh. 43213

COMMODORE SOFTWARE

HEART OF AFRICA	24.99
ONE ON ONE	24.99
RESCUE ON FRACTALUS	19.99
DAM BUSTERS	18.99
HARD BALL	18.99
LAW OF THE WEST	18.99
FLIGHT SIMULATOR	29.99
KUNG FU MASTER	19.99
KARATE CHAMP	19.99
KARATEKA	18.99
SIMONS BASIC	9.99
FAST LOAD	22.99
CHESS (COMMODORE)	12.99
PAPER CLIP	37.99
CONSULTANT	37.99
MACH 5	22.99
JANE	37.99
NEWSROOM	29.99
SYN CALC	29.99
HACKER	18.99
GHOSTBUSTERS	18.99

HOW TO ORDER: CASHIER CHECK, MONEY ORDER, MASTERCARD* or VISA* (Add 4% for charge cards) . . . NO PERSONAL CHECKS . . . NO C.O.D.'s . . . SHIPPED U.P.S. **PRICES SUBJECT TO CHANGE.**
SHIPPING: Prompt one day shipping on in-stock merchandise. Ohio residents add 5.5% sales tax. Add $3.00 on all orders under $100.00 . . . Add $5.00 on all orders over $100.00.
INTERNATIONAL: Actual freight charge on all orders outside the continental United States including A.P.O.

CALL OR WRITE FOR FREE CATALOG

CALL ELECTRONIC ONE (614) 864-9994

THE BASEBALL DATABASE

LET YOUR COMPUTER KEEP TRACK OF YOUR TEAM'S BASEBALL STATS FOR YOU!

EASY TO USE

- Clear Screen Directions
- Easy Data Entry and Correction
- Detailed Users Manual
- Fast Statistics Retrieval from Disk

COMPREHENSIVE

- 23 Batting and Fielding Statistics
- 22 Pitching Statistics
- Up To 30 Players
- Unlimited Games
- Hits, Runs, Errors, LOB & ERs for Every Inning
- All Totals, Cumulatives, Averages Etc. Calculated

DETAILED PRINTED REPORTS

- Player Rosters
- Game Summaries
- Pitching Cumulatives
- And a lot more
- Win/Loss Records
- Team Cumulatives
- Player Histories

$49.95 APPLE IIe/IIc

$39.95 COMMODORE 64

- 15 day money back guarantee
- check or money order please, plus $2.50 shipping and handling
- Program specs and details available upon request

JACOBSEN SOFTWARE DESIGNS

1590 E. 43rd Avenue Eugene, Oregon 97405
Phone: (503) 343-8030

HAVE YOU GOT THE 1541 BLUES?

WE'VE GOT THE PERMANENT FIX!!

Here's what we do . . .

FIRST, we disassemble your 1541 disk drive.
SECOND, we re-machine the stepper motor to the shaft.
THIRD, we adjust the stepper motor and align the heads.
FOURTH, we upgrade your DOS to the latest version available.

GUARANTEED FOR SIX MONTHS!

AND WE DO IT ALL IN 72 HOURS OR LESS!!

TOTAL COST . . . $69.95, plus $7.50 shipping & handling

We also service the entire Commodore Line with a 72 hour turn-around time (subject to parts availability).

C-64	59.00
1541	65.00
1702	85.00
1525/801	59.00
1526/802	75.00
1541 Flash Installed	125.00

(Includes DOS Bridge and Switch for 100% Software compatibility)

Call for Repair Prices on other Commodore Equipment
We also repair Televideo Computers and Okidata Printers

WE DO WARRANTY REPAIRS! — Call for Details
$7.50 for shipping/$15.00 for APO/FPO or outside Continental US.
Our BBS No. is 919-765-3892, Temporary Password — TRIAD

TRIAD COMPUTERS

3068 TRENWEST DRIVE, WINSTON-SALEM, NC 27103
919-765-0433

C-64™ • C-128™ • VIC-20™ • SX-64™ • Plus 4™ • C-16™ • B-128™ • PET/CBM™

One disk. 25 business programs, $29.95

Now for the good part:

The **Intelligent Software** integrated home/business/educational package comes on disk or tape at the ridiculous price of **$29.95** [plus five cents for postage + handling]. It is not public domain or home-brew software; totaling over 50 pages of source code, it was designed and tested as a package to take care of all your data processing needs.

Customers write: *". . . accolades for the authors. This is as slick a deal as I have seen and more than adequate for all except fancy presentations. The best thing is the ease of use . . "*

"I have come to consider these programs among the most valuable pieces of software I own."

The package includes:

Database: A complete multi-keyed fixed-record-length data base manager. Sort or select [using all relational operators: , = , >, <, AND, OR, NOT, wild card] on any field, perform computations on numeric fields. Any operation can be performed on all, or only selected records. All fields completely user-definable. Can be used for any number of tasks, including accounting, mailing lists, inventory control, record, tape, or book cataloging, expense account maintenance, or as an electronic rolodex. One customer writes: *"I am especially impressed with Database, and have used it to replace a half-dozen other 'database' type programs I had been using."* Even if you use your Commodore for nothing else, this program alone might justify its expense.

Word Processor: A full-featured menu-driven word processor including: very fast file commands, screen editing, text locating and full control over margins, spacing, paging, indentation, and justification. *". . . well done and highly functional . . . Provides an excellent alternative to the high priced word processors . . . this is an excellent buy. Highly recommended."* — Midnite Software Gazette. *"Provides good basic features."* — Compute's Gazette.

Copycalc: An electronic spreadsheet. Turns your Commodore into a visible balance sheet; includes screen editor. *"Excellent program for budgeting, estimating, or any math-oriented use . . . well worth the money. Highly recommended."* — Midnite Software Gazette.

Also included: **ReportGen, ReportMerge** [these interface W/P with Database to create form letters, statements, invoices, mailing labels, other reports.]; **Baseball Statistician** [compiles batting statstcs for a baseball league]; several W/P utilities, including **Index** [indexes W/P's text files]; several Database utilities, including **DBmerge** [facilitates multi-file database applications.], and **DBStat** [analyzes D/B files]; a programming utility, **ASCII,** which converts text files [program listings] into program files; also **Checkbook**; **Inventory**; **Paper Route**; **Loan Analysis**; **Breakeven Analysis**; **Depreciation**; **Labeler**; **File Copier**; more.

Versions of the package are available for every Commodore computer having a minimum of 10k RAM [including the C-128 in 128 mode]. All programs will support tape, disk, and printer. Price includes documentation; Calif. residents add 6%. Add $3 for credit card, COD, 8050 disk, or cassette orders [cassette not available for Plus4™ and 16™.] No personal checks from outside USA. This ad is the catalog; send $1 [deductible from order] for a sampling of program output.

Intelligent Software

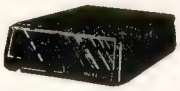
Quality Software since 1982

Box A Dept. G-7
San Anselmo, CA 94960
(415) 457-6153

commodore 64

$139.00

DRIVES



CBM1541	$179.00
CBM1571	$239.00
MSD-1	$219.00
MSD-2	$459.00
INDUS-GT (64/128)	$219.00

commodore 128

$279.00

MODEMS

Anchor Volksmodem..	$59.99
Telelearning 400.....	$39.99
CBM 1660 (C-64).....	$59.99
CBM 1670 (C-128)..	$179.00

JOYSTICKS

SPECTRAVIDEO

Quickshot 1.....	$4.99
Quickshot IV (3 way)	$12.99
12 ft. Wico extension cord..	$3.99

ACCESSORIES

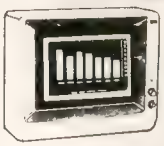
Comp Guard Protector	$14.99
Curtis SP2 Protector.	$39.99
Curtis Safety Strip .	$19.99

PRINTERS

COMREX CR-220.....	$89.99
EPSON LX-90.....	$179.00
OKIDATA Okimate 10	$199.00
STAR SG10C.....	$219.00
PANASONIC 1080..	$199.00
C.ITOH 7500 AP....	$169.00

INTERFACES

CARDCO G-WHIZ.....	$49.99
CARDCO S'MORE.....	$49.99
Digital Devices U-Print C.	$44.99
Orange Micro Grappler CD	$99.99
Tymac "The Connection"	$49.99



COLOR MONITORS

- COMMODORE 1802
- AMDEK COLOR 300
- NEC COLOR 1225

YOUR CHOICE **$169.00 ea**

DISKETTES

MAXELL MD1.....	$12.99
NASHUA SS/DD.....	$9.99
ELEPHANT SS/DD....	$13.99
GENERIC DS/DD w/Flip'n File	
10 Disk Holder.....	$12.99

AMARAY

Disk Tubs.....	$9.99

SOFTWARE

BATTERIES INCLUDED

Paperclip 64/128.....	$29.99
Paperclip/Spell Pak.....	$49.99
Spell Pak.....	$29.99
The Consultant.....	$38.99
HomePak.....	$32.99

BRODERBUND

The Print Shop.....	$29.99
Graphics Library 1,2,3 ea...	$14.99
The Music Shop.....	$29.99
Bank Street Writer.....	$39.99

COMMODORE

Jane-integrated.....	$39.99

DESIGN WARE

Creative Creator.....	$9.99
Spell-A-Hazam	$9.99
Crypto-Cube.....	$9.99

DATA SOFT

Moon Shuttle.....	$5.99
Pooyan.....	$5.99
O'Riley's Mine.....	$5.99

EPYX

Greatest Baseball.....	$4.99

HES

Multiplan.....	$19.99
Omniwriter.....	$19.99
Benji Space Rescue.....	$3.99
HES Games/Olympics	$3.99
Graphics Basic.....	$3.99

Profesional Software

Fleet Systems II C128/64....	$49.99
Trivia Fever.....	$19.99

PFS

File.....	$32.99

SPRINGBOARD

The News Room.....	$34.99
Clip Arts.....	22.99

SUBLOGIC

Flight Simulator II.....	$37.99

SPINNAKER

Rhymes & Riddles.....	$9.99
Alf Cocor Caves.....	$7.99
Bubble Burst.....	$9.99
Snooper Trooper's.....	$9.99

SYNAPSE

Pharoah's Curse.....	$4.99
Protector.....	$4.99
Sentinel.....	$4.99

EDUCATIONAL INSTITUTIONS CALL TOLL-FREE 1-800-221-4283

COMPUTER MAIL ORDER

CALL TOLL-FREE 1-800-233-8950

477 East Third Street, **Dept. A403,** Williamsport, PA 17701

SHIPPING: Add 3%, minimum $7.00 shipping and handling on all orders. Larger shipments may require additional charges. All items subject to availability and price change. Returned shipments may be subject to restocking fee.

1-800-268-3974 Ontario/Quebec

1-800-268-4559 Other Provinces

CANADIAN ORDERS
All prices shown are for U.S.A. orders. Call the Canadian Office for Can. prices.

1-416-828-0866 In Toronto

Telex:06-218960
2505 Dunwin Drive, Mississauga, Ontario Canada L5L1T1

COMPUTERS

C-64	$139.95
C-128	275.95

MODEMS

1064	$54.95	Team Modem	210.95
Westridge	59.95	1670	185.95
Mitey Mo	56.95	Compuserve	17.95
Master Modem	49.95	Tele Learning	39.95

PRINTERS

EPSON

LX90 / tractor/Atari interface	**$235.00**
LX90 / Tractor/IBM interface	**235.00**
Comrex 220 Atari/Commodore	99.00
HS80 Letterjet	319.00
RX80	**$209.00**
JX80	449.00
FX185	455.00
LQ1500 (PAR)	950.00
RX100	329.00
FX85	332.00
LX80	211.00
LQ1500 (SER)	999.00

STAR MICRONICS

SG10	**$210.95**
SG10C	235.00
SG15	369.00
SD10	321.95
SD15	441.00
SR10	469.00
SR15	582.00
Powertype	**299.95**

CITIZEN

MSP10	**$275.00**
MSP15	439.00
MSP20	439.00
MSP25	549.00

PANASONIC

1091	**$231.95**
1092	369.00
1093	425.00
3151	425.00

OKIDATA

Okimate 10	$170.95
Okimate 20	210.00
182	219.95
192	349.95
193	515.00
84	640.95

LEGEND

808 / NLQ	**$149.95**
1080	199.95
1380	259.95
1385	295.00

Printer Ribbons - Dust Covers Available

PAPER

White 20 LB

2500Shts Laz. Edge	$24.95
1000 Shts Laz. Edge	14.95
500 Shts Laz. Edge	9.95

ASSORTED PASTELS

2500 Shts Laz. Edge	$24.95
1000 Shts Laz. Edge	24.95
500 Shts Laz. Edge	14.95
Making Labels 1000 QTY	9.95

SOFTWARE

Print Shop	$27.50
Graphics Library I	17.50
Graphics Library II	17.50
Synfile	31.95
Syncalc	31.95
Home Accountant	43.00
Tax Advantage	35.95
Paperclip	45.95
Paperclip/Spell	57.95
Consultant	45.95
Homepak	41.95
Jane	32.95
Word Pro 128	65.95
Word Writer 128	49.95

INTERFACES

PPI	$39.95
G-Wiz	48.95
Tymac Connection	54.95
Xetec/8k buffer	64.95

MONITORS

TEKNIKA

MJ-10	$178.95
MJ-22	**254.95**

COMMODORE

1802	$185.95
1901	CALL
1902	259.95

ATARI

SM124	$174.95
SC1224	335.95

ZENITH

ZVM 122	$74.95
ZVM 123	74.95

NEC

1205	$125.00
1260	79.95
1201	99.95

AMDEK

300G	$117.00
300A	127.00
310A	145.00
Color 300	175.95
Color 500	239.95
Color 600	399.00
Color 700	469.00
Color 710	539.00

SYLVANIA

13" Color TV/RGB	$325.00
20" Color TV/RGB	CALL

SAMSUNG

TTLA	$95.00
TTLG	89.95

SAKATA

SC100	$179.00

DISK DRIVES

Indus GT	$229.00
1541	165.95
1571	249.95
1572	375.95
MSD Dual	459.95
Enhancer 2000	175.95

"5¼" DISKETTES

BONUS

SS/DD	$9.50
DS/DD	13.50

MAXELL

MD1	$15.95
MD2	19.95

MEMOREX

SS/DD	$12.50
DS/DD	16.50
FF50/20SS/DD	**$34.95**
FF50/20DS/DD	**40.95**

NO LABEL
With Pen and Flip-n-File Case

SS/DD	$10.50
DS/DD	16.50

All Brands Carry Lifetime Warranty

POLICY

No deposit on C.O.D. orders. Free freight on all prepaid cash orders over $300 in the Continental U.S.A. APO and FPO orders add $5.00 per hundred. For Priority Mail add $10.00 per hundred. Free shipping for PA residents. PA residents add 6% sales tax. All defective products must have a prior RA number.

"Where Prices are Born, Not Raised."

WHITE HOUSE COMPUTER

P.O. Box 4025, Williamsport, PA 17701

CALL TOLL FREE
1-800-351-3442
IN PA CALL 1-717-322-7700

MasterCard 4% VISA

AMERICAN EXPRESS 5%

Hours: Monday Thru Friday 9 a.m. - 6 p.m.

EPROM PROGRAMMERS HANDBOOK

The EPROM PROGRAMMERS HANDBOOK was written with the average user in mind. Important concepts are covered in a readable, informative manner. But the HANDBOOK is much more than theory. Many useful programs are included on the accompanying diskette. Topics include:

PROGRAMMING EPROMS
CARTRIDGE TYPES
PROTECTING CARTRIDGES
MENU MAKER
MODIFYING THE KERNAL
MODIFYING THE DOS
PAPERCLIP/ORACLE (tm) CARTRIDGE
AND MUCH, MUCH MORE . . .

Only $32.95 + Shipping
including program diskette-
approximately 150 pages

PROGRAM PROTECTION MANUAL FOR THE C-64 VOLUME II

Not just a third edition — a new and up-to-date manual covering the latest advances in program protection. Over 275 pages of valuable information. The most technical manual written on program protection for the C-64. A disk is included to help explain the concepts.

$34.95 + Shipping

PROGRAM PROTECTION MANUAL FOR THE C-64 VOLUME I

This is the original protection manual. Covers bad blocks, BASIC and ML protection schemes, reset and cartridge switches and much more. Program disk is included, with many helpful programs. If you are just getting into program protection, this volume is required reading!!

$29.95 + Shipping

1541 DISK DRIVE ALIGNMENT PROGRAM - VERSION 2

No special tools or knowledge are required to properly align the 1541 disk drive with this program (although average mechanical ability is required).

A WELL TESTED, PROVEN PRODUCT, NOW EVEN MORE ACCURATE!! VERSION 2 FEATURES A NEW CALIBRATION DISK, SPECIALLY PREPARED ON SOPHISTICATED EQUIPMENT FOR EXTRA PRECISION.

NO FANCY SCREEN DISPLAYS OR HI-RES GRAPHICS. JUST A GOOD, SOLID DISK DRIVE ALIGNMENT PROGRAM — THOUSANDS ALREADY IN USE!! SEE THE REVIEW IN THE OCTOBER 1984 ISSUE OF *COMPUTE!'s GAZETTE*.

$44.95 + Shipping

updates available to prior purchasers for
$20.00 + Shipping

CARTRIDGE BACKER II

Cartridges are saved to disk with an autoboot and will run as-is. Unlike all other cartridge backup systems, *NO EXTERNAL RAM BOARDS, ROMS OR CARTRIDGES ARE REQUIRED.*

FOR THE C-64

$54.95 + Shipping

C S M
SOFTWARE, INC.

P.O. Box 563, Crown Point, IN 46307
(219) 663-4335

VISA AND MASTERCARD ACCEPTED
DEALER INQUIRIES INVITED

Shipping $3.50 per item in U.S.; foreign orders extra

SNAPSHOT 64

SNAPSHOT 64 is the perfect answer for those looking for the ultimate backup utility. Think of it, being able to stop most any program after the protection check and then being able to resume the program at the same point, totally bypassing the protection check.

MOST EFFECTIVE UTILITY OF ITS KIND - EVEN MORE EFFECTIVE THAN THOSE UTILITIES THAT CLAIM TO "COPY ALL MEMORY-RESIDENT SOFTWARE"

INVISIBLE TO SOFTWARE - CANNOT BE DETECTED

SNAPSHOT FILES RUN BY THEMSELVES THE BACKUP COPY WILL RUN AS-IS, WITHOUT THE SNAPSHOT CARTRIDGE

WORKS MUCH FASTER THAN OTHER SIMILAR UTILITIES

EASY TO USE - NO COMPLICATED INSTRUCTIONS - EVEN A CHILD CAN DO IT

SNAPSHOT FILES ARE COMPATIBLE WITH FAST LOAD UTILITIES

SNAPSHOT FILES WILL LOAD FROM ALL COMMODORE COMPATIBLE DISK DRIVES

STORE MANY DIFFERENT SNAPSHOTed FILES ON A SINGLE DISK

FULLY SELF-CONTAINED ON CARTRIDGE - NO DISK TO HASSLE WITH

COMPLETE AND THOROUGH MANUAL IS INCLUDED

SOLD FOR ARCHIVAL PURPOSES ONLY

RAVE REVIEWS IN: *INFO 64, MIDNIGHT GAZETTE & PROGRAM PROTECTION NEWSLETTER*

$49.95 + $3.50 Shipping

MUST LIQUIDATE At Far Below Dealer Cost!
TOTAL Personal Computer System

Factory Reconditioned with Factory Warranty!

Carries easily as a suitcase!

Sorry, we can't print the famous brand name. But we can tell you if you phone us Toll-Free: 1-800-328-0609.

Famous U.S. brand 64K computer with built-in disk drive, COLOR monitor, ROM cartridge port! PLUS printer, software!

THE COMPUTER

Snap-on computer keyboard! 64K RAM, 20K ROM. Full-size typewriter keyboard. Upper and lower case letters, numerals, symbols, reverse characters. 2 cursor control keys, 4 function keys, programmable to 8. Music synthesizer with 3 independent voices, each with 9 octave range. Input/output ports accommodate . . . user, serial, ROM cartridge, joysticks, external monitor, phone modem.

Built-in disk drive! Intelligent high speed unit with 5¼" floppy disk recorder. 170K formatted data storage; 35 tracks. 16K ROM. Uses single sided, single density disk. Serial interface. Second serial port to chain second drive or printer.

Built-in color monitor! Displays 40 columns x 25 lines of text on 5" screen. High resolution. 320 x 200 pixels. 16 background, character colors.

Built-in ROM cartridge port! Insert ROM program cartridge. Multitude of subjects available in stores across the nation!

Original List Price $995.00

Liquidation Priced At Only **$388**

Item H-973-63631-00 Ship, handling: $20.00

THE PRINTER

Print method: Bi-directional impact dot matrix.
Character matrix: 6 x 7 dot matrix.
Characters: Upper and lower case letters, numerals and symbols. All PET graphic characters.
Graphics: 7 vertical dots — maximum 480 columns. Dot addressable.
Character codes: CBM ASCII code.
Print speed: 60 characters per second.
Maximum columns: 80 columns.
Character spacing: 10 characters per inch.
Line feed spacing: 6 lines per inch in character mode or 8 lines per inch selectable. 9 lines per inch in graphics mode.
Line feed speed: 5 lines per second in character mode. 7.5 lines per second in graphics mode.
Paper feed: Friction feed.
Paper width: 4.5" to 8.5" width.
Multiple copies: Original plus maximum of two copies.
Dimensions: 13"W x 8"D x 3¼"H. Wt.: 6½ lbs. **Power:** 120V AC, 60 Hz.

Original List Price: $200.00

Liquidation Priced At **$119**

Item H-973-63831-00 Ship, handling: $7.00

THE SOFTWARE

"Easy Script" One of the most powerful word processors at any price! Cut re-typing, create documents from standard paragraphs, do personalized letters, see and change a document before it is printed. Instruction manual has extensive training section that simplifies use . . . even for someone who has never used a computer or word processor before!

"The Manager" A sophisticated database manager for business or home use. Business uses: accounts payable/receivable, inventory, appointments, task manager. Home uses: mailing lists, home inventory, recipes, collection organizer, investment tracking, checkbook balancing. School uses: research article index, gradebook.

Mfr. Sug. Retail: $73.98

Liquidation Price **$24**

Item H-973-64011-03 Ship, handling: $3.00

BUY INDIVIDUAL UNITS OR GET THIS ULTRA-FAMOUS SYSTEM AT ONE LOW PACKAGE PRICE!

TOTAL Personal Computer System available at FAR BELOW dealer cost!

Original List Price $1,293.00

TOTAL PACKAGE PRICE **$488**

Item H-973-64011-02 Ship, handling: $24.00

Compatible with above Computer System (Not included in package price.)

JOYSTICKS (Set of 2)
Mfr. List: $59.90 pr.
Liquidation Price . . . . . **$19 pr.**
Item H-973-63622-01 S/H: $6.00 pr.

KEYBOARD CRAZY (Music Software)
Mfr. List: $24.95
Liquidation Price **$15**
Item H-973-64155-03 S/H: $4.25

VISA MasterCard

Credit card members can order by phone, 24 hours a day, 7 days a week.

Toll-Free: 1-800-328-0609

TeleCheck Your check is welcome! No delays when you pay by check!

C.O.M.B. Direct Marketing Corp.
Authorized Liquidator
14605 28th Avenue North
Minneapolis, Minnesota 55441-3397

SEND ME THE ITEMS I HAVE LISTED BELOW

Sales outside continental U.S. are subject to special conditions. Please call or write to inquire.

Item No.	#	Item	Price	S/H
		TOTAL		

C.O.M.B. Direct Marketing Corp. Item H-973
14605 28th Ave. N./Minneapolis, MN 55441-3397

Send the items indicated at left. (Minnesota residents add 6% sales tax. Please allow 3-4 weeks delivery. Sorry, no C.O.D.)

☐ My check or money order is enclosed. (No delays in processing orders paid by check, thanks to TeleCheck.)

Charge: ☐ MasterCard ☐ VISA

Acct. No. _____ Exp. ____/____

PLEASE PRINT CLEARLY

Name _____

Address _____

City _____

State _____ ZIP _____

Phone ( ) _____

Sign Here _____

SYMBOL MASTER™

MULTI-PASS SYMBOLIC DISASSEMBLER FOR COMMODORE 64 & 128**

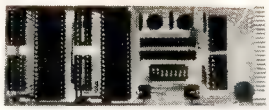
(Includes C-128 native 8502 mode)

disassembles any 6502/6510/8502 machine code program into beautiful source

- Learn to program like the experts!
- Adapt existing programs to your needs!
- Automatic LABEL generation.
- Outputs source code files to disk fully compatible with your MAE,* PAL,* CBM,* Develop-64,* LADS* or Merlin* assembler, ready for re-assembly and editing!
- Outputs formatted listing to screen and printer.
- Automatically uses NAMES of Kernal jump table routines and all operating system variables.
- Disassembles programs regardless of load address. Easily handles autorun "Boot" programs.
- Generates list of equates for external addresses.
- Generates complete cross-referenced symbol table.
- Recognizes instructions hidden under BIT instructions.
- 100% machine code for speed. Not copy protected.

ORDER NOW! $49.95 postpaid USA. Disk only.

*MAE is a trademark of Eastern House. PAL is a trademark of Pro-Line. Commodore 64 & 128 are trademarks and CBM is a registered trademark of Commodore. Develop-64 is a trademark of French Silk. LADS is a trademark of Compute! Publications. Merlin is a trademark of Roger Wagner Publishing.



UNLEASH THE POWER OF YOUR COMMODORE 64 WITH THE ULTIMATE INTERFACE

- Control and monitor your home—appliances, lights and security system
- Intelligently control almost any device
- Connect to Analog-to-Digital Converters
- Control Robots
- Perform automated testing
- Acquire data for laboratory and other instrumentation applications
- Many other uses

Don't make the mistake of buying a limited capability interface. Investigate our universally applicable Dual 6522 Versatile Interface Adapter (VIA) Board, which plugs into the expansion connector and provides:

Four 8-bit fully bidirectional I/O ports & eight handshake lines • Four 16 bit timer/counters • Full IRQ interrupt capability • Four convenient 16-pin DIP socket interface connections • Expandability up to four boards & sixteen ports.

ORDER NOW! Price $169, postpaid USA. Extensive documentation included. Each additional board $149.

COMMODORE 64™ SOURCE CODE!

"What's Really Inside the Commodore 64"

• Most complete available reconstructed assembly language source code for the C-64's Basic and Kernal ROMs, all 16K. • You will fully understand calls to undocumented ROM routines, and be able to effectively use them in your own programs. • Uses LABELS. Not a mere one-line disassembly. All branch targets and subroutine entry points are shown. • TABLES are fully sorted out and derived. • Completely commented, no gaps whatsoever. You will see and understand the purpose of every routine and every *line* of code! • Complete listing of equates to external label references. • Invaluable fully cross-referenced symbol table. Order C-64 Source. $29.95 postpaid USA.

PROFESSIONAL UTILITIES:

We personally use and highly recommend these two:

- PTD6510 Symbolic Debugger for C-64. An extremely powerful tool with capabilities far beyond a machine-language monitor. $49.95 postpaid USA.
- MAE64. Fully professional macro editor/assembler. **$29.95** postpaid USA.

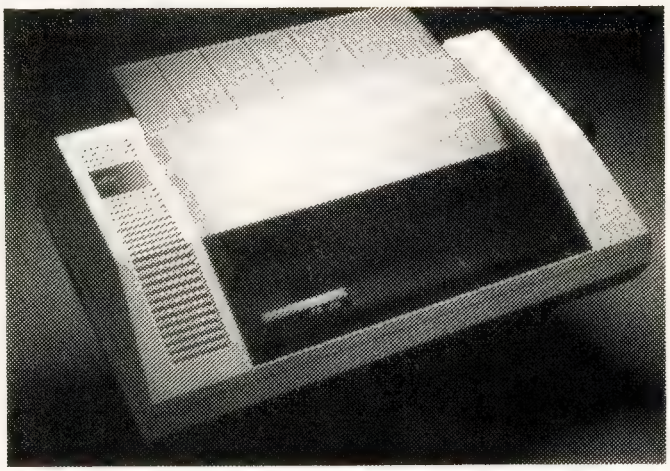
All orders shipped from stock within 24 hours via UPS. VISA/MasterCard welcomed. There will be a delay of 15 working days on orders paid by personal check.

SCHNEDLER SYSTEMS

1501 N. Ivanhoe, Dept. G-3 , Arlington, VA 22205. Information/Telephone Orders (703) 237-4796

— COMMODORE —

FAR BELOW DEALER COST



COMREX 220

PRINTER

FOR THE **C-64**

WARRANTIED BY

EPSON

RETAIL $200.00

NOW ONLY **$99.00**

T & D ELECTRONICS 10517 UPTON CIRCLE MINNEAPOLIS, MINNESOTA 55431

call **TOLL FREE 1-800-328-8322** EXT. 581

Software Discounters of America

For Orders Only—1-800-225-7638
PA Orders—1-800-223-7784
Customer Service 412-361-5291

Open Saturday

- Free shipping on orders over $100 in continental USA
- No surcharge for VISA/MasterCard
- Your card is not charged until we ship

ACCESS
Beach Head 2 (D) . . . $24
Mach 5(R) $23
Mach 128(R) $33
Raid Over Moscow (D) $24
ACTIVISION
Borrowed Time (D) . . $19
Fast Tracks: Slot Car Const. Kit (D) . $21
Garry Kitchen's Gamemaker (D) . . . $25
Great American Cross-Country Road Race (D) $19
Hacker (D) $19
Little Computer People (D) $23
Master of Lamps (D) . $19
Mindshadow (D) $19
Space Shuttle (D) . . . $19
ACCOLADE
Dambusters (D) $19
Hard Ball (D) $19
Law of the West (D) . . $19
Fight Night (D) $19
PSI-5 Trading Co. (D) $19
AMERICAN EDUCATIONAL
Biology (D) $16
French (D) $16
Grammar (D) $16
Science: Grades 3/4(D) $16
Science: Grades 5/6(D) $16
Science: Grades 7/8(D) $16
Spanish (D) $16
U.S. Geography (D) . . $16
World Geography (D) $16
World History (D) . . $16
AMIGA SOFTWARE
Borrowed Time
Deja Vu
Hacker — CALL
Halley Project — FOR
Keyboard Cadet
Marble Madness — LOW
One-on-One — PRICES
Print Shop
Seven Cities of Gold
Sky Fox
ARTWORX
Bridge 4.0 (D) $16
Grand Master Chess(D) $17
International Hockey (D) $19
Sorcery (D) $19
Strip Poker (D) $21
Data Disk #1 female . . $16
Data Disk #2 male $16
Data Disk #3 female . . $16
ARTWORX PX
Baker St. Detective (D) . $7
Cavefighter (D) $7
Galaxy (D) $7
Hole in One Golf (D) . . $7
Jumpin' Jimmy (D) . . $7
Pro Boxing (D) $7
Starbase Defense (D) . . $7
Zodiac (D) $7
AVALON HILL
Jupiter Mission 1999(D) $23
Maxwell Manor (D) . . $17
Panzer Jaqd (D) $19
Ripper (D) $19
Super Bowl Sunday (D) $21
SBS 1984 Team Disk . $14
T.A.C. (D) $26
Telenguard (D) $19
Tournament Golf (D) . $19
BATTERIES INCLUDED
Consultant 64 or 128 . $39
Home Pak (D) $33
Keys to Typing (D) . . . $17
Paperclip 64 or 128 . . $39
Paperclip w/Spell 64 or 128 . . . . . $49
BETTER WORKING
Spread Sheet (D) $33
Word Processor (D) . . $33
BRODERBUND
Bank St. Filer (D) $33
Bank St. Mailer (D) . . $33
Bank St. Writer (D) . . $33
Bank St. Speller (D) . . $33
Champ Loderunner(D) $23
Karateka (D) $19
Music Shop (D) $29
Print Shop (D) $26
P.S. Companion . . . . Call
P.S. Graphics Library #1 (D) $16
P.S. Graphics Library #2 (D) $16
P.S. Graphics Library #3 (D) $16
Stealth (D) $19
CARDCO
G-wiz . . . . . Call
S'more (R) $47
Write Now (R) $19
CBS
Big Bird's Funhouse(R) . $9
Felony (D) $16
Mastering the SAT(D) $47
Success w/Algebra . Call
Success w/Math . . . . Call
DATAMOST
Kwik-Calc (D) $14
Kwik-Check (D) $14
Mychess II (D) $19
DATASOFT
Alternate Reality (D) . $25
Bruce Lee (D) $19
Mr. Do (D) $16
The Goonies (D) $19
DAVIDSON
Math Blaster (D) $33
Speed Reader 2 (D) . . $43
Spell It (D) $33
Word Attack (D) $33
DESIGNWARE
Body Transparent (D) $27
Grammar Examiner (D) $27
Mission Algebra (D) . $27
Spellicopter (D) $25
States & Traits (D) . . . $27
ELECTRONIC ARTS
Adv. Const. Set (D)
Archon 2: Adept (D)
Bard's Tale (D)
Carriers at War (D)
Europe Ablaze (D)
Heart of Africa (D)
Mail Order Monsters (D)
Movie Maker (D)
Music Const. Set (D)
One-on-One (D)
Pinball Const. Set (D)
Racing Dest. Set (D)
Reach for Stars (D)
Seven Cities of Gold (D)
Skyfox (D)
Prices too low to advertise! . . . . . Call
EPYX
Ballblazer (D) $25
Fast Load (R) $23
Jet Combat Simulator (D) $19
Koronis Rift (D) $25
Multiplan 64 or 128 . . $39
Programmer's Basic Tool Kit 64 or 128 . $29
Rescue on Fractalus (D) $25
Summer Games 2 (D) $25
Temple of Apshai Trilogy (D) $25
The Eidolon (D) $25
Winter Games (D) . . . $25
World's Greatest Baseball (D) $23
World's Greatest Football (D) $25
FIRST STAR
Spy vs. Spy (D) $19
Spy vs. Spy 2 (D) . . . $19
Superman (D) $19
FISHER PRICE
First Men in the Moon Math (D) . . . $16
Movie Creator (D) . . Call
Peter & The Wolf Music (D) $16
Peter Rabbit Reading (D) $16
GAMESTAR
On-Court Tennis (D) . $19
On-Field Football (D) $19
On-Track Racing (D) . $17
Star-League Baseball (D) $19
Star Rank Boxing (D) . $19
HAYDEN
Sargon III (D) $33
HES
Cell Defense (D) . . . $12
Hes Mon $21
Millionaire (D) $16
Omniwriter w/Spell (D) $33
Project Space Station (D) $16
Super Zaxxon (D) . . . $12
INFOCOM
Cut Throats (D) $23
Deadline (D) $29
Enchanter (D) $23
Hitchhiker's Guide to the Galaxy (D) . . . $23
Infidel (D) $25
Invisiclues . . . . . Call
Planetfall (D) $23
Sorcerer (D) $25
Spellbreaker (D) . . . $29
Suspect (D) $25
Wishbringer (D) $23
Zork 1 (D) $23
Zork 2 or 3 (D) $25
KOALA
Muppet Learning Keys (D) $34.95
Touch Tablet w/Painter(D) . . . $39.95
Koala Printer (D) $16
LEARNING COMPANY
All Titles Available . . Call
MICROLEAGUE
Baseball (D) $25
General Manager (D) . $25
1984 Team Data Disk $16
1985 Team Data Disk $16
MICROPROSE
Acro Jet Advanced Flight Simulator (D) Call
Crusade in Europe (D) Call
F-15 Strike Eagle (D) . . Call
Kennedy Approach (D) Call
Nato Commander (D) Call
Silent Service: The Submarine Simulation (D) . Call
MINDSCAPE
Bank St. Music Writer (D) $26
Bank St. Storybook (D) $26
Color Me: The Computer Coloring Kit (D) . . . $19
Color Me Picture Disks:
Hugga Bunch $7
Rainbow Brite $7
Shirt Tales $7
Tink! Tonk! $7
Dolphins Rune (D) . . . $19
Halley Project (D) . . . $26
Lords of Midnight (D) $19
Mr. Pixel's Cartoon Kit (D) $21
Mr. Pixel's Game Maker (D) $21
Perfect Score SAT (D) . $44
Quake Minus One (D) $19
Shadowfire (D) $19
Show Director (D) . . . $19
MISC
Buckaroo Banzai (D) . $21
CSM 1541 Alignment Kit (D) . $29
Central Point-Copy II (D) $23
Commodore 64 Software Book $14
Diskey (D) $33
1541 User's Guide (Book) $16
Firebird Elite (D) $21
Inside Commodore DOS (Book) $16
Karate Champ (D) . . . $23
Kung Fu Master (D) . . $23
Print Master (D) $23
Snapshot 64 (R) . . . Call
Sorcerer of Claymorgue Castle (D) $21
Superbase 64 (D) $47
Superbase 128 (D) . . . $59
VIP Terminal XL (D) . . $26
Vizastar 64 XL8 (D) . . $79
Vizastar 128 (D) . . . . Call
Vizawrite 128 (D) . . . . Call
ORIGIN
Ultima 3 (D) $34
Ultima 4 (D) $39
PROFESSIONAL SOFTWARE
Fleet System 2—W.P. w/70,000 word spell checker 64 or 128 $39
PRACTICORP
Practicalc 64 (D) . . . $16
Practifile (D) $16
RANDOM HOUSE
Alpine Encounter (D) $19
Charlie Brown's ABC's (D) $19
Charlie Brown's 1,2,3's (D) $19
Snoopy's Reading Machine (D) $19
Typing Is A Ball, Charlie Brown (D) . $19
SCARBOROUGH
Boston Computer Diet (D) $33
Build A Book (D) $17
Build A Book Refills $9.95
Mastertype (D) $23
Net Worth (D) $44
SIERRA
Championship Boxing (D) $17
Donald Duck's Playground (D) $17
Grog's Revenge (D) . . $17
Homeword (D) $32
Mickey's Space Adventure (D) $17
Stunt Flyer (D) $17
Ultima 2 (D) $37
Winnie the Pooh (D) . $17
SIMON & SCHUSTER
Dell's Xword Puzzles Vol. 1 or 2 (D) $14
Lovejoy's SAT (D) . . . $49
NY Times Crossword Puzzles Vol. 1 or 2 (D) $14
Spy Hunter (R) $29
Star Trek-The Kobayashi Alternative (D) . . . $26
Typing Tutor III (D) . . $26
SPINNAKER
Adventure Creator (R) $17
Alphabet Zoo (R) $17
Counting Parade (D) . $17
Facemaker (R) $15
Fraction Fever (R) . . . $15
Homework Helper-Math Word Problems (D) $23
Homework Helper-Writing (D) $23
Kids on Keys (R) $17
Kidwriter (D) $17
Kindercomp (R) $17
Math Busters (D) $17
Snooper Troops 1 or 2 (D) $17
Story Machine (R) . . . $17
Trains (D) $19
SPRINGBOARD
Early Games (D) $21
Easy as ABC (D) $23
Fraction Factory (D) . $19
Newsroom (D) $33
N.R. Clip Art (D) $19
Stickers (D) $23
SSI
Baltic 1985 (D) $23
Battle of Antietam (D) $33
Battalion Commander(D) . . $25
Breakthrough in the Ardennes (D) $37
Broadsides (D) $25
Colonial Conquest (D) $25
Computer Ambush (D) $37
Computer QB (D) $25
Field of Fire (D) $25
Fifty Mission Crush (D) $25
Gemstone Warrior (D) $23
Germany 1985 (D) . . . $37
Imperium Galactum(D) $25
Kampfgruppe (D) $37
Mech Brigade (D) . . . $37
NAM (D) . . . . . Call
Norway 1985 (D) $23
Phantasie (D) $25
Pro Tour Golf (D) . . . $25
Questron (D) $25
Rings of Zilfin (D) . . . Call
Ringside Seat (D) . . . $25
U.S.A.A.F. (D) $37
Wings of War (D) $25
Wizard's Crown (D) . . Call
SUBLOGIC
Flight Simulator II (D) . $32
Flight Simulator Scenery Disks (D) . Call
Jet (D) $29
SYNAPSE
Blue Max 2001 (D) . . . $19
Brimstone (D) $25
Essex (D) $25
Lode Runner's Rescue (D) $19
Mindwheel (D) $25
Syn-Calc (D) $33
TELARIUM
Amazon (D) $21
Dragonworld (D) $21
Fahrenheit 451 (D) . . $21
Nine Princes in Amber (D) $21
Perry Mason: Case of the Mandarin Murder (D) $21
Rendezvous w/Rama (D) $21
TIMEWORKS
Accts. Payable (D) . . . $39
Accts. Receivable (D) $39
Data Manager 2 (D) . . $33
Data Manager 128 . . . $43
Electronic Checkbook (D) $16
Evelyn Wood Dynamic Reader (D) $33
General Ledger (D) . . $39
Inventory Mgmt (D) . . $39
Money Manager (D) . . $16
Payroll Mgmt (D) $39
Sideways (D) $19
Swiftcalc/Sideways (D) $33
Swiftcalc/Sideways 128 . . . $43
Swiftax (D) $33
Sylvia Porter's Personal Financial Planner(D) $39
Word Writer w/Speller (D) $33
Word Writer w/85000 Word Speller 128 . . $43
TRONIX
S.A.M. (D) $39
WEEKLY READER
Stickybear ABC'S (D) $19
Stickybear Math (D) . $19
Stickybear Numbers(D) $19
Stickybear Opposites (D) $19
Stickybear Reading (D) $19
Stickybear Shapes (D) . $19
WINDHAM CLASSICS
Alice in Wonderland(D) $17
Treasure Island (D) . . $17
Wizard of Oz (D) $17
ACCESSORIES
Bonus SS, DD . . **Cheap**
Bulk Disks . . . . . **Cheaper**
Compuserve Starter Kit (5 hrs) $19
Datashare Printer Int. w/ Graphics $39
Disk Case (Holds 50) . . $9
Disk Drive Cleaner . . . $6
Dow Jones News Retrieval Kit (5 hrs) . $16.
Sakata 13" Color Composite Monitor for C64 . . . . . $149
Total Auto Answer/Auto Dial Modem w/Software $29.95
Wico Bat Handle . . . $17
Wico Boss $12

Modem Owners:

Have you seen our on-line catalog of over 500 software titles for Commodore, Atari & Apple Computers? It's on Compuserve's Electronic Mall—Just type GO SDA and shopping for software will never be the same again! P.S. If you don't own a modem or subscribe to Compuserve, call us, do we have a deal for you!

P.O. BOX 278—DEPT. CG—WILDWOOD, PA 15091

*Ordering and Terms: Orders with cashier check or money order shipped immediately. Personal/company checks, allow 3 weeks clearance. No C.O.D.'s. **Shipping: Continental U.S.A.**—Orders under $100 add $3; **free shipping on orders over $100.** PA residents add 6% sales tax. **AK, HI, FPO-APO**—add $5 on all orders. Sorry—no International orders. Defective merchandise will be replaced with same merchandise. Other returns subject to a 15% restocking charge—NO CREDITS! Return must have authorization number (412) 361-5291. Prices subject to change without notice. **Modem Owners:** Save A Fortune! Join Our Discount Disk Club! call for details

IT'S LIKE

FREE DISKETTES

U.S. PAT. 4,488,368

Your 5¼" single side disks are usable on the other side. You paid for one side, why not use the other... **IT'S FREE!** Nibble Notch will **open** your **new** disk. It's easy... won't harm existing data. **SATISFACTION OR MONEY BACK**

nibble notch I

For Apple, Franklin, Commodore, & Atari (w/Atari Drives); square notch.

only $14.95* PLUS P&H

Call for HIGH QUALITY DISKETTES as low as 99¢

ORDER TODAY

*Add $2 ($5 foreign) for postage & handling. FL residents add 5% sales tax.

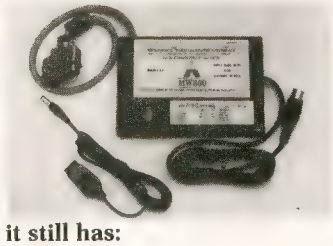
TOLL FREE 1-800-642-2536

FL (305)748-3770

or send check or money order to:

nibble notch®
computer products
4211 NW 75th Terrace • Dept. 143
Lauderhill, FL 33319

IS IT POSSIBLE TO MAKE THE BEST ANY BETTER?!



NEW! CPM-128 Mode

- Standard 4K Buffer

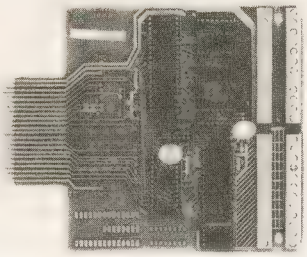
★ ★ ★ ★ ★ ★ ★ ★

And it still has:

- Built-in Self Test with Status Report
- Microprocessor controlled emulation of Commodore printers for compatability with popular software
- Optional Transparent Mode
- External switch selectable Commodore graphics mode for Epson, Star Micronics, C. Itoh Prowriter, Okidata, Seikosha, Banana, BMC, Panasonic, Mannesman-Talley, Think Jet & others.

NEW INTRODUCTORY SALE!
PRICE $89.00

Universal Input/Output Board for C-64 & C-128



- 16 Channel 8-bit A/D converter with 100 microsecond sampling time.
- 1 D/A output
- 16 high voltage/high current discrete output
- 1 EPROM socket
- Use multiple boards for additional channels up to 6 boards

MW-611 ..... $225.00

Dealer Inquiries invited

Micro World Computers, Inc. (303) 987-9531
3333 S. Wadsworth Blvd. #C105
Lakewood, CO 80227

MICRO R&D INCORPORATED

NEW VERSION 2.0

THE MIRROR

DISK COPIER

$24.95

NO FINER OR MORE ADVANCED ARCHIVAL COPIER AVAILABLE AT ANY PRICE.
EASY TO USE. DOES NOT CAUSE DRIVE HEAD TO KNOCK.
COPIES UP TO 41 TRACKS.
PERIODIC UPDATE POLICY.
AUTOMATICALLY MAKES BACK-UP COPIES FROM VIRTUALLY ALL PROTECTED SOFTWARE.
NIBBLES, HALF TRACKS, COPIES EXTRA SECTORS AND EXTRA TRACKS.
REPRODUCES ALL DISK ERRORS AUTOMATICALLY.
FAST, COPIES FULL DISK IN AS LITTLE AS 4-7 MINS. EVEN COPIES ITSELF.

WE COPY MORE!
MASTERCARD, VISA, M.O. OR CHECK OK
+ $3 SHIPPING & HANDLING
C.O.D. OR FOREIGN ORDERS ADD $2
CALIF. ORDERS ADD 6% SALES TAX
— WRITE OR CALL —

Compumed
(408) 758-2436
P.O. BOX 6427
SALINAS, CA 93912
FOR COMMODORE 64 AND 1541 DRIVE

SATISFACTION GUARANTEED OR MONEY BACK

1985 TAX RETURN HELPER

Fast and easy income tax preparation

- This is the 5th annual edition - thousands of repeat customers
- Includes Form 1040, Schedules A, B, C, D, E, G, SE, W, Forms 2106, 2441 and 4562
- Enter and modify data on a screen copy of the form.
- Works like a spreadsheet - all the lines affected by a change are instantly updated.
- Automatic tax computation.
- Data can be saved on disk and updated.
- Also included:

TAX DBASE

A data base program to create and maintain files of tax related items (medical, car expenses, etc.) that can be used directly by the tax programs.

- Can be used all year round. Also good for many other accounting jobs (checkbook balancing, etc.)

Price is **tax deductible. C64 disk: $33 (+ $1.50 S&H)**

PROFESSIONAL VERSION - also prints data on IRS forms: $45 (+ $1.50 S&H)

Previous customers prices: $22 and $30 for pro-version (+ $1.50 S&H)

KSOFT CO.
845 WELLNER RD.
NAPERVILLE, IL 60540
(312) 961-1250

Dealer inquiries welcome.

Sensational Prices!
. . . On Our Most Popular Items!

from microfal® . . .

THE 69¢ DISKETTE!

Are you paying too much for diskettes? Try our first quality, prime, 5¼" diskettes (no rejects, no seconds) at these fantastic sale prices and save, save, SAVE! Disks are packaged in boxes of 50; each box contains 5 shrink-wrapped 10-packs that include diskettes in sleeves, labels, and write-protect tabs.

Each diskette is certified to be 100% error free and comes with a lifetime warranty (if you have a problem, we'll replace the diskette). All diskettes include hub reinforcement rings and write-protect notch.

All diskettes are double density and work in either single or double density drives.

SS, DD Diskettes, Box of 50
32391 **$34.50–69¢ ea.!**

DS, DD Diskettes, Box of 50
32403 **$44.50–89¢ ea.!**

$ LOWEST PRICES IN U.S.A.! $

Star Micronics, Inc.

BMC AXIOM INDUS
EPSON CARDCO

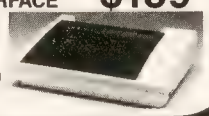
We can offer you some of the lowest prices in the country on the most popular printers, monitors and interfaces. Our normal prices are already low, but to make sure you get the best deal you can, we will also meet most competitive prices in this publication when placed on an equal basis (*Remember—we don't charge for use of your credit card, impose excessive shipping fees, or use any other hidden extras to boost the price you pay. Due to the rapid change in prices in the computer industry, we can only meet prices at the time you place your order; we cannot adjust prices on items ordered or shipped on an earlier date.*) Another plus for charge card customers—your charge card is billed at time of shipment only for the items shipped—no early billing, no long wait for the merchandise you already paid for.

COMMODORE		**CARDCO**		**STAR MICRONICS**	
C-128 Computer	$CALL	G-Wiz Interface	$CALL	SG-10	$CALL
1571 Disk Drive	$CALL	S'MORE	$CALL	SG-10C	$CALL
1902 Monitor	$CALL			**EPSON**	
1670 Modem	$CALL			FX-85	$CALL
				FX-185	$CALL

We also carry famous name software. . . Epyx, Broderbund, Muse, CBS, Sierra, Timeworks, Random House, Activision, and more!

★ THE BEST PRICES ★
★ THE BEST SERVICE ★
WHY SHOP ANYWHERE ELSE?

PRINTER PLUS GRAPHICS INTERFACE **$189**
100 cps, Near Letter Quality, parallel interface.
35044 **$189**



POWER and PROTECTION FOR YOUR C-64!

POW'R PAK 64

Pow'r Pak is a replacement power supply (1.5 amp) for the Commodore 64 . . . but that's not all! Pow'r Pak also supplies two additional surge protected outlets (120V) for monitor, disk drive, or other peripherals. On/off switch. Fuse protection. Sturdy all-metal casing is ventilated for heat dissipation. Full 1 year warranty.

34910 **$49.95**

COMPUTERFACTS™ from SAMS

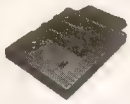
Technical Service Data for Your Computer and Peripherals

Sams introduces COMPUTERFACTS™ . . . packets of information that reveal the inner workings of major brand micros, monitors, printers and disk drives. Includes schematic wiring diagrams, parts lists, disassembly instructions, troubleshooting techniques, and other repair data.

33477 Commodore 64 Computer
33513 VIC-20 Computer
33551 Commodore Plus/4 Computer
33481 Commodore 1541 Disk Drive
33496 Commodore 1525 Printer
33508 Commodore C16 Computer
33546 Commodore 1701 Monitor
35950 Gemini 10X Printer
35964 Gemini 15X Printer

All packets $17.95 each

CARTRIDGE EXPANDER



Plus $22.95 *FAST LOAD* OFFER!

Stop wearing out your computer by endless cartridge swapping! The Navarone cartridge expander features 3 cartridge slots. Select any cartridge, or the "off" position if no cartridge is to be used. Reset the computer independently of the power switch. Cartridge slots are vertical for easy access — no blind fumbling behind the computer.

33227 3-slot Cartridge Expander **$22.95**

The cartridge expander is a great companion for the Epyx Fast Load cartridge — you can keep it permanently installed plus have two sides free for other cartridges!

34216 Fast Load Cartridge (Sug. Retail $39.95) **$24.95**

Fast Load Only $22.95 with purchase of cartridge expander!

DUST COVER and "EVERYTHING BOOK" SPECIAL OFFER

Get to know us by ordering this great dust cover for your C-64 or C-128 and our catalog, "The Everything Book for the C-64 and C-128 Home Computers," for $2.95 (no extra shipping and handling charges). Cover is antistatic, translucent 8-gauge vinyl sewn to our exacting standards with reinforced seams. Discover the savings and easy shipping available from TENEX Computer Express!

$2.95

31627 C-64 Dust Cover and Catalog (G1M)
38464 C-128 Dust Cover and Catalog (G1M)

The Right Interface For All Your Printing Needs!!

PPI with graphics

". . . a sound investment for your Commodore."
RUN, Dec. '85

This high-performance graphics parallel printer interface from DSI for C-64 and VIC-20 emulates a Commodore printer. Comes with cables and user's manual

33565 **$39.95**

GMI Interface

Built-in buffer provides super high-speed printing for parallel printers. Prints all Commodore characters. Cables and connectors included. From Cardco. Lifetime warranty.

34484 **$CALL**

From Your Friends At
TENEX Computer Express

We gladly accept mail orders!
P.O. Box 6578
South Bend, IN 46660

Questions? Call 219/259-7051

Ad G1M

SHIPPING CHARGES

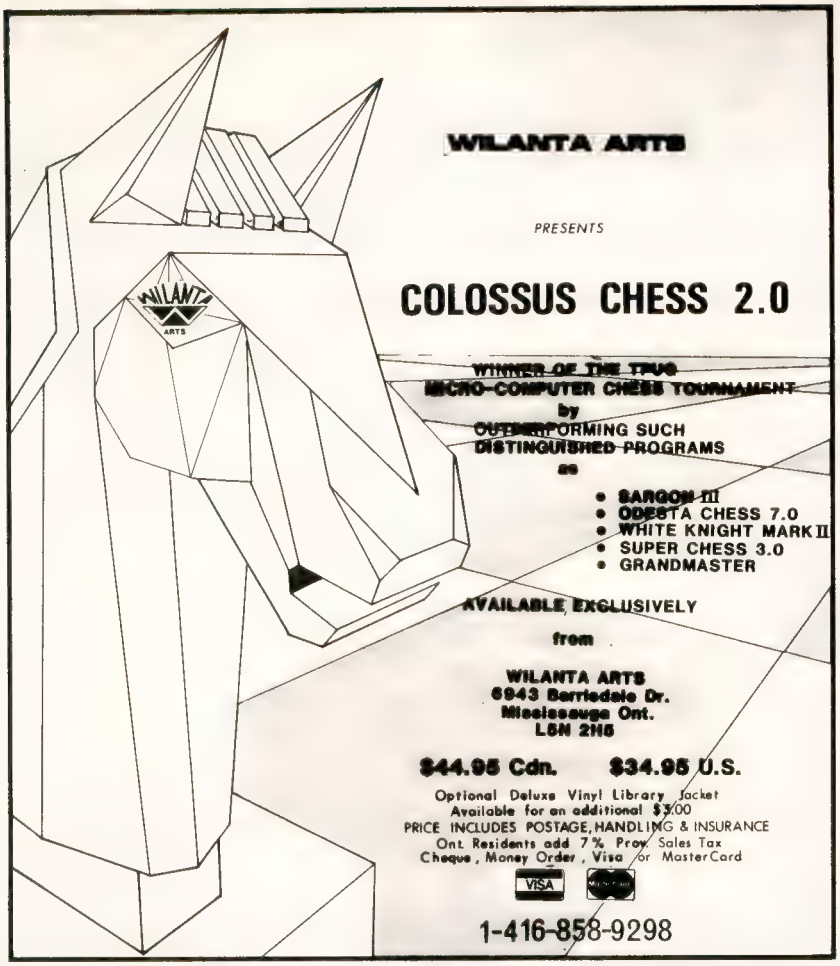
ORDER AMOUNT	CHARGE
less than $20.00	$3.75
$20.00–$39.99	4.75
$40.00–$74.99	5.75
$75.00–$149.99	6.75
$150.00–$299.99	7.75
$300 & up	8.75

MasterCard VISA

NO EXTRA FEE FOR CHARGES

WE VERIFY CHARGE CARD ADDRESSES.

ORDER TOLL FREE
1-800-348-2778



WILANTA ARTS

PRESENTS

COLOSSUS CHESS 2.0

WINNER OF THE TPUG MICRO-COMPUTER CHESS TOURNAMENT by OUTPERFORMING SUCH DISTINGUISHED PROGRAMS as

- SARGON III
- ODESTA CHESS 7.0
- WHITE KNIGHT MARK II
- SUPER CHESS 3.0
- GRANDMASTER

AVAILABLE EXCLUSIVELY from

WILANTA ARTS
6943 Barrisdale Dr.
Mississauga Ont.
L5N 2H5

$44.95 Cdn. $34.95 U.S.

Optional Deluxe Vinyl Library Jacket Available for an additional $3.00
PRICE INCLUDES POSTAGE, HANDLING & INSURANCE
Ont. Residents add 7% Prov. Sales Tax
Cheque, Money Order, Visa or MasterCard

VISA

1-416-858-9298

NOW GET TRUE DESCENDERS FOR 801, 1525, 803, GP-100, HUSH 80 & SIMILAR PRINTERS

From the Descender ROM People

WILANTA ARTS

SAMPLE ACTUAL SIZE

FEATURING:

gypsy
pager
peopl

- True descenders
- A pleasing alternative
- Uniform character formation
- No change in graphic capability
- No change in software compatibility
- No change in printer operation
- North American standard font
- Complete instructions
- Easy installation
- No soldering

$39.95 Cdn $29.95 U.S.

Ont. Residents add 7% Prov. Sales Tax
Cheque, Money Order, Visa or MasterCard

VISA MasterCard

WILANTA ARTS
6943 Barrisdale Dr.
Mississauga Ont.
L5N 2H5

1-416-858-9298

Get a Wilanta Descender ROM Today and make your old nightmare Just a font memory of yesterday!

Help "Design" the On-Line Service of the Future!

Answering these questions can help you get *more* out of your PC...and determine if you qualify for a valuable free offer...

- Take this opportunity to try the new service at no charge in exchange for your feedback on the survey.
- Join scores of PC owners in this exciting developmental opportunity. It's like being there for the design of the PC or some new software.

1. What make and model of PC do you own?
☐ Commodore 64 or 128 ☐ Apple II
☐ IBM PC or Compatible ☐ Other _____
make/model

2. Do you own a disk drive? ☐ Yes ☐ No

3. Do you own a modem? ☐ Yes ☐ No
☐ No, but plan to buy within 6 months

4. Have you ever tried an on-line service? ☐ Yes ☐ No
If yes, would you consider using one? ☐ Yes ☐ No
If no, would you consider trying one? ☐ Yes ☐ No

5. Which of these credit cards do you use?
☐ VISA ☐ MasterCard
☐ American Express ☐ None

6. Please rate the following on-line services and features according to your own personal needs. (Use a 1 to 5 point scale, where "5" means "extremely important" and "1" means "not important at all.")

Services	Rate 1-5	Features	Rate 1-5
Current news/sports		Low cost—pennies/minute	
Banking services		No monthly subscription fees or minimums	
Encyclopedia		Local phone access	
On-line shopping		Fast and easy to learn, understand and use	
Advice from computer experts		English language command structure	
Airline reservations		Billable to credit card	
On-line communications with other PC owners			

THANK YOU. Please print the following information, so we can contact you if you qualify for the free offer or if we have any questions.

Your Name _____

Address _____ Apt. No. _____

City/State/Zip _____

( ) _____
Phone

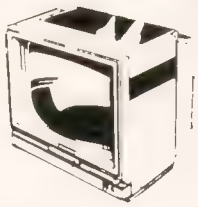
See if you qualify for a free offer on this new service. Complete and mail survey today to... On-Line Service Survey. Attention: Steve Elliott, 625 N. Michigan Ave., Suite 1900, Dept. 8802, Chicago, Illinois 60611.

CG-LB

commodore

MONITORS DISK DRIVES

NEW UNITS
$139

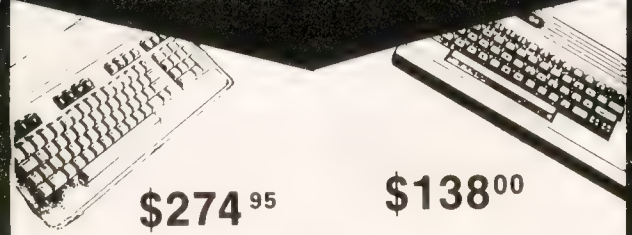


FULL COLOR RGB/Composite perfect for the C-128 or C-64

NEW UNITS $149

1541 COMMODORE

COMPUTORS



$274.95

$138.00

COMMODORE 128

C64

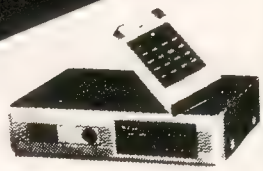
VIDEO

VCR's HOME DECK VHS $249.00

PORTABLE VIDEO RECORDER $198

CABLE TV

NO PAY TV?



UHF DECODERS, VHF CONVERTERS JERROLD, OAK, SCIENTIFIC, ATLANTA ZENITH

MORE INFORMATION — CALL TODAY

T & D ELECTRONICS

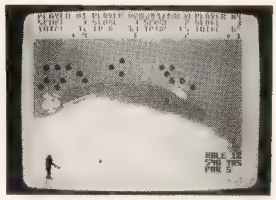
10517 UPTON CIRCLE
BLOOMINGTON, MN 55431

MasterCard VISA

call TOLL FREE

1-800-328-8322 EXT. 581

At Last, A Computer Golf Game That's Really Up To Par.



Now you can play computer golf the way it was meant to be. No more dull simulations. You hit every shot—hooks and slices; delicate wedge shots; dazzling putts. Championship Golf blends skill, strategy, timing, and realistic action to create a golf game you can enjoy again and again.

- ☐ Tee it up on golf's most challenging courses, starting with world famous Pebble Beach
- ☐ Order more courses and create your own mini-tour
- ☐ Full club selection
- ☐ Variable pin positions
- ☐ Two skill levels
- ☐ Scorecard printout
- ☐ Play solo or with up to a foursome of competitors
- ☐ Detailed color graphics with close-ups for putting

CHAMPIONSHIP GOLF
At Pebble Beach

On disk for the Commodore 64/128. Send money order, cashier's check or personal check for $24.95. California residents add 7% sales tax ($1.75).

- ☐ Payment enclosed
- ☐ Send C.O.D. Add $3.00 for C.O.D. charges

Name _____

Address _____

City _____

State/Zip _____ Phone _____

SPORTSWARE

5234 War Wagon Drive, San Jose, CA 95136

FOR COMMODORE 64

• TRACKMIMIC™ •

— NEW —
Ver. 2.2
Protected Disk Backup System
Installs in 1541 Drive in Minutes
Just Plug It In!!
2 Minutes For Full Disk Backup
New Bit Density Detector
Automatic Operation, Hyperscan
Sector Edit (GCR), Bit Density
Tracks 1-45
• For All New Protection Methods •
89.95

• DISKMIMIC 5+™ •

Our Famous Automatic
Backup System
49.95

DISKAT - Cataloging Program

Reads data directly from Disk, Holds 8000 Files, Makes Labels, Recalls 12 Way's, Alphabetizes Files, Printer/Screen Output.
34.95

A.I.D. CORP.
4020 Hempstead Turnpike • Bethpage, New York 11714
(516) 731-7100
Diskmimic 5™ is a trademark of A.I.D. Corporation
Commodore 64™ & 1541™ is a trademark of Commodore Electronics, Ltd.
Shipping & Handling — $1.50 each

Commodore Service

3-5 Day Turn Around
(subject to parts availability)

C-64 Repair $55.00
1541 Alignment . $35.00
1541 Repair $75.00
Other Computers . . $CALL

Parts & Return Shipping Included.
Parts & Power Supplies Also Available

To save C.O.D. charges — send Unit & Power Supply with check or M.O.

Second Source Engineering
9901 Horn Rd., Ste. B
Sacramento, CA 95827
(916) 364-5134

VISA master charge

DUST COVERS

★ CUSTOM MADE TO FIT
★ Heavy 32-oz. VINYL ANTI-STATIC
★ EXTENDS EQUIPMENT LIFE
★ Choice of Colors Lt. Tan or Brown

COMPUTERS	
C-64; VIC-20; C-16; Plus 4	8.00
C-128, B-128	13.00
DATASETTE (NEW, C2N)	5.00
DISK DRIVES	
C-1541; C-1571 INDUS GT	8.00
MSD S/D; APPLE S/D	8.00
MSD D/D; APPLE D/D UNIT	10.00
ENHANCER 2000	8.00
PRINTERS	
C-1525/MPS801	10.00
C1526/MPS802	13.00
C/MPS 803; C-1520	8.00
PANASONIC KX-P1090/91	13.00
EPSON MX/RX/FX 80	13.00
GEMINI 10 & STAR 10's	13.00
GEMINI 15 & STAR 15's	16.00
OKIDATA 91/92	13.00
OKIMATE 10	8.00
MONITORS	
C-1702	16.00
C-1902/AMIGA	19.00
ZENITH ZVM 122/123	16.00
AMDEK COLOR I, 500/700	19.00
TEKNIKA MJ 10/22	19.00
CM-141	19.00
BMC COLOR	16.00
VIDEO RECORDERS (Dimensions Required)	13.00

Order by stating NAME and MODEL and COLOR CHOICE TAN or BROWN.
Enclose check or money order plus $1.50 per item (4.50 max.) shipping and handling California Res. Include 6.5% Sales Tax.

SPECIAL COVERS WILL BE MADE TO YOUR DIMENSIONED SKETCH. SEND YOUR REQUIREMENTS FOR OUR LOW PRICE QUOTES

Crown Custom Covers
9606 SHELLYFIELD RD., Dept. A
DOWNEY, CA 90240
(213) 862-8391

Nashua™

Limited lifetime warranty. Ten-packed in boxes with write protect tabs, labels.

	50+	100+
5¼" SS/DD	88¢	85¢
5¼" DS/DD	99¢	96¢

	250+	500+
5¼" SS/DD	54¢	53¢
5¼" DS/DD	68¢	64¢

Packaged in quantities of 50, sold in quantities of 250 only.

SONY 3½" SS Disks

$1.95 each, Qty. 20
$1.89 each, Qty. 50
$1.85 each, Qty. 100

RIBBONS (sold in sixes only)

Apple Imagewriters
Black . . . . . **$3.45** each
Rainbow Color 6-pack
(red, green, yellow, blue, purple, brown) . . . . . **$4.75** each

ROLLTOP FILES

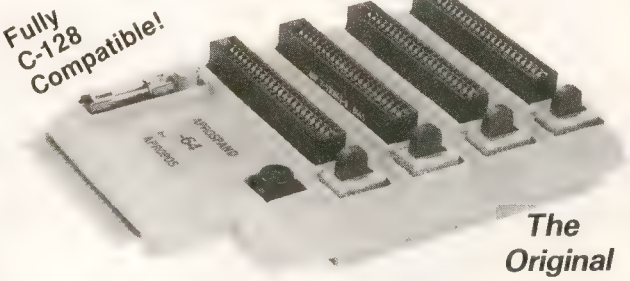
3½" rolltop, holds 55 . . . . . **$17.49**
5¼" rolltop, holds 120 . . . . **$24.99**
Include labels, dividers, anti-skid feet.

CALL TOLL FREE 1 800 USA-FLEX
In Illinois 1 (312) 351-9700
7 to 7 Central Time
10 to 3 Saturdays

USA FLEX
135 N. Brandon Drive Glendale Heights, IL 60139

Shipping/handling additional. Minimum order $50.00 Visa, MasterCard and Prepaid orders accepted. Corporations rated 3A2 or better and government accounts are accepted on a net 30 basis. C.O.D. orders add an additional $5.00 special handling charge . . APO, FPO, AK, HI & PR orders add an additional 5% to the total order amount to cover PAL and insurance. No sales tax outside of Illinois.

APROSPAND-64™ Gives your Commodore 64 or 128 full expandability! This superbly designed expansion module plugs into the expansion port & gives you 4 switchable (singly or in any combination) expansion connectors - plus fuse protection - plus a reset button! Before you buy an expander, be sure that it has a fuse to protect your computer and that you can activate your cartridges in **ANY** combination allowed by the cartridges.



The Original

Reduced to ONLY $29.95

Commodore Interfaces and Accessories

ParallAX-CD Parallel Printer Interface for use with all Commodore incl. SX-64 (except PET)	$59.95
DSI PPI Printer Interface with Graphics	$44.95
Cardprint G-WIZ Printer Interface	$48.95
Cardprint +G Printer Interface	$39.95
TH002 300 Baud Direct Connect Modem	$35.00
RAMAX-VIC-20 2 Slot Expander w/27K RAM	$59.95
RAMAX Kit. RAMAX without RAM	$24.95

Add Shipping Per Item: $3.00 Cont. U.S. $6.00 CAN, Mex, PR, HI, AK, UPS Blue

APROTEK
1071-A Avenida Acaso, Camarillo, CA 93010
CALL OUR TOLL FREE ORDER LINES TODAY:
1-(800) 962-5800 USA or 1-(800) 962-3800 CALIFORNIA
TECHNICAL INFORMATION: 1-(805) 987-2454
All Products have 2 Week Satisfaction or Money Back Guarantee

CA Res Add 6% Tax
Listed are cash prices.
Visa or MC add 3%

TESTING

...JUST GOT EASIER!

TESTMASTER–ONLY $35.00

- ★ END TEST RE-TYPING FOREVER!
- ★ EFFORTLESSLY PRODUCE MULTIPLE CHOICE, TRUE-FALSE, SHORT ANSWER, COMPLETION TESTS
- ★ BUILD A BANK OF TEST ITEMS TO USE FROM YEAR TO YEAR
- ★ UPPER / LOWER CASE AND COMPLETE EDITING FACILITIES
- ★ PRODUCE TESTS FROM 1 TO 999 ITEMS
- ★ PRODUCE ALTERNATE FORMS OF THE SAME TEST
- ★ PRINTS ANSWER KEY AND MATCHING STUDENT RESPONSE SHEET FOR EACH FORM PRINTED

FOR COMMODORE 64, 32K PET, APPLE II FAMILY, AND IBM

FREE TRIAL IN YOUR SCHOOL FOR 30 DAYS

Please Add $2.00 Per Order For Postage and Handling

SEND FOR OUR FLYER OF OTHER USEFUL SOFTWARE
WRITTEN BY TEACHERS FOR TEACHERS

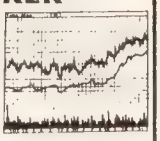
MIDWEST SOFTWARE
Box 214 Farmington, MI 48024
VISA / MASTERCARD

ORDER LINE 9:00 A.M. - 5:00 P.M. **1-800-422-0095**
Michigan, and orders after 5:00 P.M. - (313) 477-0897

ACORN OF INDIANA™

STOCK BROKER™

BEAT THE PANTS OFF MUTUAL FUNDS



BUYING GOOD QUALITY, VOLATILE ISSUES AND USING THE TRADING SYSTEM WILL HAVE YOU FULLY INVESTED AT THE LOWEST PRICES AND CONVERTING TO CASH AS THE STOCK NEARS ITS PEAK.

- BAR GRAPH PRINT-OUTS.
- RECORD UP TO 144 STOCKS ON A DISK.

$39.95 C-64 DISK

LOTTO CIPHER™

GET THE BEST ODDS ON ANY LOTTERY
SIX NUMBER - PICK FOUR - DAILY GAME

- PRODUCES FOUR COMBINATIONS OF NUMBERS TO CHOOSE FROM.
- ANY AMOUNT OF BALLS AND NUMBERS CAN BE PROGRAMMED.
- PRINTS OUT PAST LOTTO NUMBERS DRAWN, PAST COMPUTER PICKS, AND NUMBER DRAW FREQUENCY LIST.
- COMPLETE NUMBER DATA BASE.

$29.95 C-64 DISK

ABANDON SHIP™

S.O.S.

SAILOR JOE HAS VOLUNTEERED TO STAY BEHIND AND KEEP THE SHIP AFLOAT UNTIL HIS CREW MEMBERS ARE RESCUED. CAN HE MAKE IT OR WILL HE HAVE TO ABANDON SHIP? PATCH THE HOLES AND SEAL OFF HOPELESS ROOMS WHILE FIGHTING INVADING SEA CREATURES.

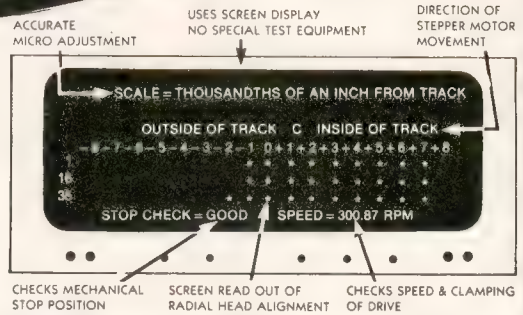
$21.50 C-64 DISK

ACORN OF INDIANA, INC.
2721 OHIO STREET
MICHIGAN CITY, IN 46360
219-879-2284

SHIPPING AND HANDLING, ADD $1.50 - C.O.D.'S ACCEPTED
VISA AND MASTER CARD ORDERS ADD 4%
INDIANA RESIDENTS ADD 5% SALES TAX
DEALER INQUIRIES WELCOME

1541 PHYSICAL EXAM

NEW 1571 PHYSICAL EXAM
4040 PHYSICAL EXAM
8050 PHYSICAL EXAM
8250 PHYSICAL EXAM


ACCURATE MICRO ADJUSTMENT
USES SCREEN DISPLAY NO SPECIAL TEST EQUIPMENT
DIRECTION OF STEPPER MOTOR MOVEMENT
SCALE = THOUSANDTHS OF AN INCH FROM TRACK
OUTSIDE OF TRACK C INSIDE OF TRACK
-8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8
STOP CHECK = GOOD
SPEED = 300.87 RPM
CHECKS MECHANICAL STOP POSITION
SCREEN READ OUT OF RADIAL HEAD ALIGNMENT
CHECKS SPEED & CLAMPING OF DRIVE

SEE REVIEWS IN:
MIDNITE GAZ. #23 p. 78
RUN 6/85 p. 14
AHOY 4/85 p. 82

PACKAGE INCLUDES:

- **Quiet drive stops to reduce the need for continued realignment on alps and neutronics drives.**
- **True digital alignment disk with offset track**

Physical Exam $39.95 (each + ship) Extra Stops $4.95 (each + ship)

Please specify which drive.

ORDERS 800 762–5645

CARDINAL SOFTWARE
13646 Jeff Davis Hwy. Woodbridge, VA, 22191 INFO CALL: (703) 491–6502

IN CANADA: APPIN MICRO, 1283 Pharmacy Ave. Scarborough, Ontario, M1R 2J1 (416) 443–0843

LEARN PROGRAMMING

MASTER COMPUTERS IN YOUR OWN HOME

Now you can write programs and get a computer to do just what you want. Get the most out of any computer, and avoid having to pay the high price of pre-packaged software

LEARN AT YOUR OWN PACE IN YOUR SPARE TIME

Our independent study program allows you to learn about computers, operations, applications and programming in your spare time, at home. Our instructors provide you with one-on-one counseling

LEARN EVEN BEFORE YOU DECIDE ON A COMPUTER

Everything is explained in simple language. You will enjoy learning to use a computer—EVEN IF YOU DON'T OWN ONE. Learn to program on any personal computer; IBM, APPLE, COMMODORE, TRS, and more.

BE YOUR OWN COMPUTER EXPERT

Programming is the best way to learn to use computers, and we can show you the best—and most economical—way to learn programming!

Send today for your free information package. No obligation. No salesman will call.

halix INSTITUTE — CENTER FOR COMPUTER EDUCATION
1543 W. Olympic = 226 Los Angeles CA 90015-3894

HALIX INSTITUTE CENTER FOR COMPUTER EDUCATION DEPT 62 3
1543 W. OLYMPIC = 226 LOS ANGELES CA 90015-3894

YES! Send me information on how I can learn about computers and programming at home!

Name _____ Age _____

Address _____

City _____ State/Zip _____

MIKE KONSHAK
Introduces...

dfile 128™

designed specifically for
COMMODORE C-128 COMPUTER

A FULL FEATURED DATABASE FOR:

- ☐ GENEALOGY STUDIES
- ☐ INVENTORIES
- ☐ MAILING LISTS
- ☐ FINANCIAL REPORTS
- ☐ SCIENTIFIC DATA ACQUISITION, CALCULATIONS

GENERAL RECORD KEEPING FOR HOME-OFFICE-EDUCATION.

- FAST MEMORY MANAGEMENT
- SINGLE OR MULTI-DISK DRIVES
- 80 COL RGB/40 COL MONITORS
- UNLIMITED FIELDS TO 160 CHRS
- MULTI-FIELD SEARCHES/SORTS
- 16 COL. REPORTS/4-UP LABELS
- UTILITY PROGRAMS AVAILABLE

19.95 FOREIGN ORDERS ADD 2.00
MC & VISA ACCEPTED
COLO. RES. ADD 3½%

michaelsoft™
A COTTAGE INDUSTRY OF HOMESPUN SOFTWARE
Mike Konshak, 4821 Harvest Ct. (303) 596-4243
Colorado Springs, CO 80917 USA
Call Anytime.

Wicked Wendy's
House of Discounts

HARDWARE	List Price	WENDY'S Price
MODEMS		
MITEY MO 300 baud C-64 automodem incl. **free** Smart 64 terminal s/ware, $15 **free** CompuServe access time, **free** PlayNET demo software and 2 hr **free** use	$119	$57
80 COLUMN CARTRIDGE DATA 20 XL 80 cartridge with **free** spreadsheet and word-processor s/ware included	$100	$87
$$$ WICKED WENDY'S WHOPPING HARDWARE SPECIAL $$$ **MITEY MO & XL80 card** *only $132* **Save $87!**		
SOFTWARE		
VIZASTAR-64 three in one with spreadsheet, data base and graphics	$119	$85
VIZASTAR-128 NEW! for the C-128	$119	$99
SMART 64 +4 terminal software for any modem, allows upload/download, x-modem, VT52/VT100 emulation & more	$40	$28
6th Sense - the ultimate home modem program. You control its actions even when you're away. It thinks!	$89	$68
NEW SMART 64 USER'S MANUAL by CDI, makes a sophisticated program easier to use than the original manual	$13	$8
$$$ WICKED WENDY'S WHOPPING SOFTWARE SPECIAL $$$ **MITEY MO & VIZASTAR -64** *only $132* **Save $106!**		

ALL ITEMS SHIPPED WITHIN 72 HOURS OR WE PAY SHIPPING! CASHIER'S CHECK, MONEY ORDER, VISA OR M.C. ACCEPTED. SHIPPING AND HANDLING EXTRA. ADD 4% FOR VISA OR M.C. CALIF RESIDENTS ADD 6.5% TAX.
PRICES SUBJECT TO CHANGE WITHOUT NOTICE. PRODUCT SUBJECT TO AVAILABILITY.

TO ORDER CALL
800-WICKED W
Hours M-F 8:00-5:00 PST
For California residents or customer service call 415-632-1220 or send your order to:
WICKED WENDY'S HOUSE OF DISCOUNTS
24 HAMILTON CT. - PACIFICA, CA 94044

CONVERSE WITH YOUR COMPUTER

AT LAST! A FULL IMPLEMENTATION of the original ELIZA program is now available to run on your Commodore 64!

Created at MIT in 1966, ELIZA has become the world's most celebrated artificial intelligence demonstration program. ELIZA is a non-directive psychotherapist who analyzes each statement as you type it in and then responds with her own comment or question—and her remarks are often amazingly appropriate!

Designed to run on a large mainframe, ELIZA has never before been available to personal computer users except in greatly stripped down versions lacking the sophistication which made the original program so fascinating.

Now, our new Commodore 64 version possessing the **FULL** power and range of expression of the original is being offered at the introductory price of only $25. And if you want to find out how she does it (or teach her to do more) we will include the complete **SOURCE PROGRAM** for only $20 additional.

Order your copy of ELIZA today and you'll never again wonder how to respond when you hear someone say, "Okay, let's see what this computer of yours can actually do!"

READ WHAT THE EXPERTS SAY ABOUT OUR VERSION OF ELIZA:

"Much more than a mere game...You'll be impressed with ELIZA...A convincing demonstration of Artificial Intelligence." —*PC MAGAZINE*

"Delightful entertainment...An ideal medium for showing off your system." —*MICROCOMPUTING MAGAZINE*

"ELIZA is an astounding piece of software...A fascinating program to use and study." —*BARON'S MICROCOMPUTER REPORTS*

"ELIZA is a great way to introduce your friends to computers...A very funny party game." —*PETER A. McWILLIAMS*

"ELIZA is an exceptional program, one that's fun to use, shows off your machine, and has great historical interest." —*POPULAR COMPUTING MAGAZINE*

"This version of ELIZA is the best we have seen. As a party game, it is unmatched." —*HOME APPLICATIONS FOR THE C-64*

ELIZA IS AVAILABLE IN THE FOLLOWING FORMATS:
(Please specify Disk or Cassette)

1. Protected Version $25
(Protected Version can be run but not listed or modified)
2. Un-protected Commodore 64 BASIC Source Version $45
(Source Version can be listed and modified as well as run)
Both versions include a six page user manual.

Please add $2.00 shipping and handling to all orders
(California residents please add 6½% sales tax)

ARTIFICIAL INTELLIGENCE RESEARCH GROUP
921 North La Jolla Avenue, Dept. G
Los Angeles, CA 90046
(213) 656-7368 (213) 654-2214
MC, VISA and checks accepted

C-64
GRAPHICS

FOR USE WITH **PRINT SHOP**™ PROGRAM
(Print Shop is a trademark of Broderbund Software™)

THEME GRAPHICS DISK
Logo Fixin's
Military
Baseball
Restaurant Fare
General Subjects
$10.95

GRAPHIC DISK AND MORE!
120 Original Graphics
60 Greeting Card Verses
Hints/Aids/Examples
Graphics Making Tool
$14.95 **FREE**

Add $2.00 for postage & handling
Calif. residents add 6.5% sales tax
☐ **THEME $10.95**
☐ **MORE! $14.95**
NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
SEND CHECK OR M.O. TO: **C.O.D.**

RJ softshop
4102 E. 7th ST., STE. 207C
LONG BEACH, CA. 90804
Phone (213) 434-1580

LIBRARY DISKS FOR THE PRINT SHOP™

Personalize your Graphics Collection with

SELECT YOUR OWN

CHOOSE any 5 SUBJECTS per DISK for **$19.90**

Available for the **Commodore 64. Apple II+/IIe/IIc**

List of SUBJECTS
☐ AUTOMOTIVE ☐ CIRCUS ☐ RAILROAD ☐ SIGNS
☐ WESTERN ☐ KIDS ONLY ☐ HIS & HERS
☐ MUSIC MAKER ☐ SPACE ☐ FOOTBALL-NFC
☐ FOOTBALL-AFC ☐ SEAWORTHY

Include $2.00 Shipping & Handling
1990 Software
1632 Pleasant Valley Blvd.
Altoona, PA 16602
(814) 942-1990

The Print Shop is a trademark of Broderbund Software

HARD DISK FOR C-64!

Complete with drive, interface, power supply, and enclosure.

5Mbyte $599.95
10Mbyte $749.95
20Mbyte $899.95

Also available:

Floppy $124.95

Ramdisk (256k) $179.95
(512k) $229.95

Print Spooler $129.95

RS-232 Controller $149.95

To order or for information:

WRITE: Research Service Labs
P. O. Box 19124
OKC, OK 73144

CALL: (405)745-9322
8am-4pm CST
Monday-Friday

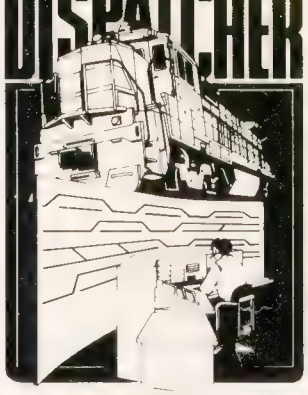
3 EXCITING COMPUTER SIMULATIONS from SIGNAL

COMPUTER CONSULTANTS

Are available from SIGNAL COMPUTER CONSULTANTS, Ltd , P.O. Box 18222, Dept. 11, Pittsburgh, PA 15236, or call (412) 655-7727. US and Canada add $2.50 postage and handling ($4.00 foreign) for each game ordered. PA residents include sales tax. Use Master Card, VISA, moneyorders or checks drawn on US or Canada banks. Master Card and Visa show card number, expiration date and signature. We guarantee and support our products. Free replacement or full refund for 30 day warranty period. Dealer inquiries invited

TRAIN DISPATCHER

Color TV or Monitor recommended.



Adapted for home computers by designers of systems for major railroads, **TRAIN DISPATCHER** faithfully simulates operations in a railroad traffic control center. In an accelerated 8 hour shift you must move up to 12 trains in both directions through a 150 mile territory–throwing switches and clearing signals to keep the trains on schedule

VIC 20, COMMODORE 64 and ATARI 400, 800, 800XL versions available at $25.00. Apple II, II+, IIe, IIc $30 00; IBM PC $35.00. Tape or Disk except ATARI 400-tape only; IBM PC and Apple-disk only Other requirements: VIC-20-16K Ram; ATARI 400, 800-Basic; IBM PC-Graphics Card

LOCOMOTIVE SWITCHER

LOCOMOTIVE SWITCHER brings an operating railroad layout to the COMMODORE 64 computer screen The microlayout consists of mainline, six switches and seven loading areas. Sophisticated car-motion logic simulates train movements to a degree not possible on "real" model railroad layouts

LOCOMOTIVE SWITCHER operates in two modes. As a FLAT YARD cars must be "spotted" at assigned loading docks – or pulled out to the mainline. In HUMP YARD mode the layout becomes a mini-classification yard Operator performance is tracked and scored based on number of cars spotted, train moves, car damage and operating time

For COMMODORE 64 only (disk or tape) at $30 00 Manual and keyboard template included

SONAR SEARCH

You never see the submarines Rely on sonar sounds to track and attack evading enemy targets

As commander of a group of three destroyers you must locate, pursue and sink a "Wolfpack" of 5 subs Guided only by the realistic "pinging" of returning sonar echoes and bearing to target, **SONAR SEARCH** offers a unique and authentic simulation of WWII antisubmarine warfare

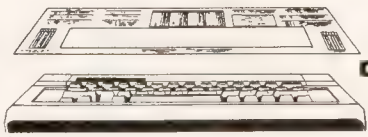
Available on disk or tape for the Commodore 64 at $30 00, plus postage and handling. Includes fully illustrated manual and keyboard template Not recommended for children under 12

Having Trouble Remembering All The Commands For Your Programs??

YOU NEED

LEROY'S CHEATSHEET®

KEYBOARD OVERLAYS



FOR COMMODORE 64™

LEROY'S CHEATSHEETS® are plastic laminated keyboard overlays designed for use with popular software, hardware, and languages for Commodore 64 computers.

These cut-out-yourself help sheets fit over the keyboard, putting hard to remember program commands right at your fingertips. The actual keystrokes are in **bold** type and any variables are shown in *italics*. Now you can use your software faster, more easily, and more effectively. With LEROY'S CHEATSHEETS® you'll never have to hunt for a program command again.

ONLY $3.95 EACH

- ✓ FITS OVER KEYBOARD
- ✓ PUTS PROGRAM COMMANDS RIGHT AT YOUR FINGERTIPS
- ✓ SAVES TIME — ENDS FRUSTRATION
- ✓ GET TO KNOW YOUR SOFTWARE BETTER
- ✓ LEARN NEW SOFTWARE FASTER, EASIER
- ✓ STURDY PLASTIC LAMINATE
- ✓ UNBEATABLE PRICE!!

CIRCLE YOUR CHOICES

Basic	Multiplan	VIP Terminal
Blanks (set of 3)	OmniWriter	Vizastar
Consultant	Paper Clip	WordPro 3+
Disk 1541	PractiCalc 64	WordPro 64
Doodle	PractiCalc II	Write Now!/64
Easy Script	Simons' Basic	Epson FX & RX Printers
Flight Simulator II	Sky Travel	Gemini 10, 15x
Fleet System 2	Speedsript	1525, MPS 801, 803
For the Beginner	Superbase	1526, MPS 802
Manager	Vidtex	Okidata 92, 93

DOZENS MORE AVAILABLE

QUANTITY _____ X $3.95 = $.

SHIPPING $ 1.00*

6% TAX (Pa only) $.

TOTAL $.

* U.S. & CANADA $1.00 FOREIGN ORDERS $3.00 CHECK, M.O., MC/VISA U.S. FUNDS NO C.O.D.

MC/VISA # _____

EXPIRATION DATE _____

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

VISA MasterCard

CHEATSHEET PRODUCTS INC
P.O. Box 111368 Pgh., Pa. 15238
(412) 781-1551

GAZ 1

All programs listed in this magazine are available on the *GAZETTE Disk*. See elsewhere in this issue for details.

To receive additional information from advertisers in this issue, use the handy reader service cards in the back of the magazine.

Classified

SOFTWARE

COMMODORE: TRY BEFORE YOU BUY. Top 25 best-selling games, utilities, new releases. Visa, MasterCard. Free brochure. Rent-A-Disk, 908 9th Ave., Huntington, WV 25701 (304) 522-1665

Free membership in SW club. Top British C64 progs. Member's discount. Introduct. offer: membership, catalog & reviews (no strings.) Arrow Express, Box 660-G3, Northport, WA 99157

ENGINEERS, TECHNICIANS, STUDENTS
LINCAD 64 - Analyze and design linear electronic circuits on the Commodore 64. Graphics, optimization, sensitivity, more. For disk and 56 page manual, $49 plus $3.50 p/h. Ohio res. add 5.5% tax. Ask about our IBM-PC Version. SOFCAD Electronics, Inc., P.O. Box 21845, Columbus, Ohio 43221

PROJECT PLANNING/MANAGEMENT using the C64, SX, or C128. Data sheet for SASE-Prgm for $106.95 (CA res. add 6% sls tx). LAWCO, Dept. CH, Box 2009, Manteca, CA 95336

SMART SHOPPER—Efficiently use coupons, sales, rebates to save money. C64 Disk. Send $30 to: Third Wave Technologies, 2122 W. Monona, Phoenix, AZ 85027

50 PRACTICAL PROGRAMS for C64, C16, +/4 Many exclusive & innovative programs. Tape or disk, $19.95 postpaid. DYNABYTE, P.O. Box 2021, Michigan City, IN 46360.

ARB BULLETIN BOARD FOR THE 64 & 128
Uses Punter & Xmodem Protocols, 27 Msg. Categories, Dating Board & More! $64.95 (BBS) 718-645-1979 * (Voice) 718-336-2343 L&S Computers, PO Box 392, Bkln, NY 11229

Genealogy Program for the C64. **"FAMILY TREE"** will produce Pedigree Charts, Family Group Records, Individual Files, Indexes, Searches of Ancestors. LDS version available. "The Best" genealogy program for the 64. $49.95, GENEALOGY SOFTWARE, POB 1151, PORT HURON, MI 48061, (519) 344-3990.

Animal Records maintained with **"PETIGREE"** for the C64. Produces Litter, Awards, Breeding, Show, Individual Records, Pedigree Charts. $69.95. GENEALOGY SOFTWARE, POB 1151, PORT HURON, MI 48061, (519) 344-3990

FREE SOFTWARE CATALOG!
Call Toll-Free 1-800-554-1162, Tevex, Inc. Save 1/3 off retail prices. We carry SSI, Elect. Arts, Infocom, and many more!

RISK FREE OFFER. PERSONAL HOME INVENTORY program. Organize, retrieve, search and sort 1500 items with ease! For C64/128. 10 day money-back guarantee. Disk and manual only $19.95. Order now. WHAT'S OUR WORTH? 116 Bermondsey Way NW, Calgary, AL T3K1V4

COLLECTOR'S ITEM: Star Trek collectors Disk/Tape with several Star Treks from 1975 to 1985. Send $13.95 to Author's Club, 6027 S. High, Suite 410 Oklahoma City, Oklahoma 73149

SPECIAL ED. PROGRAMS FOR THE 64.
Learning Handicaps, Physical Disability, Early Learning. Send for Free Brochure: SCIENCE OUTREACH - Rm. 3, 1731 Howe Ave. #410, Sacramento, CA 95825. (916) 427-7248

BUSINESS APPLICATIONS - C64 - DISK.
Decision Analysis or Mult. Alternative $24.95. People Analysis for Mgmt. & Sales $21.95. R. Lewter & Assocs., 5104 Linda Lou Dr., Carmichael, CA 95608

Play HEARTS on C64 against 3 computer card experts! Several game variations. $10 disk. Barry Miller, 258 Toftrees Ave. #216 State College, PA 16803

DATAMASTER™ — Commodore 128 Database.
Easy-to-use, powerful, 80-col. Find data instantly; do labels and reports. Send $29.95 + $2 p/h to BOUNCING DOG SOFTWARE, P.O. Box 6753, Mpls, MN 55406

LET THE ADVENTURE BEGIN!! We will show you how to program your own adventure game for fun or profit! Includes info & disk or tape (C64) with game you can easily modify $14.95. Blue Cavern Software, 558 J St., Chula Vista, CA 92010

C64 Multiple Program Disk.
Games, Utilities and more!! $24.95
Mail Money Order to: Florid Software,
PO Box 27, Templeton, MA 01468

For SpeedScript 3.0+: /SPELLBOUND/-huge RAM + disk speller for rapid checking. Also /SPEEDPAK/ - the S.S. enhancer. C64 disks $15 ea. Upstart Publishing, Dept. G3, POB 22022, Greensboro, NC 27420

100 GRAPHICS + USEFUL SCREEN MAGICS
All new for use with PRINTSHOP™ & C-64. Send: $15 ppd (TX res. add .66 tax) To: PRINT-IT, POB 9626, Longview, TX 75608

PLAY TV's "WHEEL OF FORTUNE"
COM 64/128. Great fun for all ages. Send $14.95 to Mike Day, 4747 Snow Dr., San Jose, CA 95111. Indicate Tape or Disk.

HARDWARE

NEW FOR YOUR 64 - Auto start, auto load & run M/L cart. with: Reset button, unew prg. one button disk commands, much more. Specify screen colors. $32.95 ch/m.o. to: FINTRONICS, P.O.B. 222, Atascadero, CA 93422

COMMODORE C128 80-CHARACTER CABLE. No need for RGB1 monitor. 8 char. on reg. monitor. Just $9.95 + $2 s/h to: UNITED Research, 7723 R'horse Ln., Boerne, TX 78006

Hey! Monitor Cables $5.95. Joystick ext. 6'- $3.95, 12'-$4.95. p/h incl. Comdr Disk + Print Cables Custom $3 + .75/ft. + p/h. JCRL, 5043 E. Mitchell, Phoenix, AZ 85018 (602) 990-4643

MISCELLANEOUS

300 BAUD - MAKE FRIENDS BY MODEM!
CALL 1-818-842-3322 - SHOP BY MODEM AT >>FANTASY PLAZA<< BY CALLING 1-818-840-8066 - TRY IT, YOU'LL LOVE IT!

Want to use Commodore files on an IBM-PC? We'll transfer your text or data from a 64, 128 or 8032 to an IBM-PC fast and inexpensively No re-typing! Satisfaction guaranteed! Call or write to Bob or Paul at C&B Consulting, 374 Porter St., Melrose, MA 02176 (617) 665-6617

EARN MONEY, PART OR FULL TIME, AT HOME with your computer - manual & forms: $9.95. Write computer programs for PROFIT! How-to guide with forms, letters, tips: $7.95. Also Computer Consultant Handbook. How to earn $$ consulting with business: $7.95. Send to: JV Tech, P.O. Box 563, Ludington, MI 49431

COMPUTE!'s Gazette Classified is a low-cost way to tell over 275,000 microcomputer owners about your product or service.

Rates: $25 per line, minimum of four lines. Any or all of the first line set in capital letters at no charge. Add $15 per line for boldface words, or $50 for the entire ad set in boldface (any number of lines.)

Terms: Prepayment is required. Check, money order, American Express, Visa, or MasterCard is accepted. Make checks payable to COMPUTE! Publications.

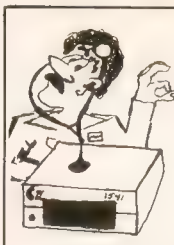
Form: Ads are subject to publisher's approval and must be either typed or legibly printed. One line equals 40 letters and spaces between words. Please underline words to be set in boldface.

General Information: Advertisers using post office box numbers in their ads must supply permanent address and telephone numbers. Orders will not be acknowledged. Ad will appear in next available issue after receipt.

Closing: 10th of the third month preceding cover date (e.g., June issue closes March 10th). Send order and remittance to: Harry Blair, Classified Manager, COMPUTE!'s Gazette, P.O. Box 5406, Greensboro, NC 27403. To place an ad by phone, call Harry Blair at (919) 275-9809.

Notice: COMPUTE! Publications cannot be responsible for offers or claims of advertisers, but will attempt to screen out misleading or questionable copy.

PRODUCT MART



Commodore SERVICE

★ Normally 48 Hour Turn-Around.
★ C64 Repair $40.00
★ 1541 Alignment 25.00
★ 1541 Repair 40.00
Parts Included
(Power Supply Extra)

To save C.O.D. charges – send unit and power supply with check or M.O. to:

DIGITAL SOLUTIONS INC.
1122 - 9th St.
Altoona, PA 16601
(814) 944-0405

DISKS 69¢

Foolish to pay more.
Dangerous to pay less.

- QUALITY MEDIA
- LIFETIME REPLACEMENT GUARANTEE
- HUB RINGS
- TYVEC EPS.
- WRITE PROTECTS

	1–50	51+
5.25" SSDD	.79	.69
5.25" DSDD	.89	.79
PC FORMATTED	1.09	.99
AT 1.2MB/3.5 1D (Mac)	1.99	CALL

BLACKSHIP COMPUTER SUPPLY
P.O. Box 883362
San Francisco, CA 94188
In California 415-550-0512
USA orders 800-431-6249
In Canada 403-428-6229

Add $3.00 shipping and handling per 100 Diskettes
COD add $1.95 (CA residents add 6.5% sales tax)
VISA MC COD

NOW USE BOTH SIDES OF YOUR DISKETTE!

5¼" DISKETTE HOLE PUNCH

WITH HOLE GUIDE and EDGE GUIDE

PUNCH OUT IS ALWAYS IN THE RIGHT POSITION
Available for IMMEDIATE Shipment
only $10.00 add $2.00 shipping
CHECK or MONEY ORDER

DEALER INQUIRIES INVITED

FOR OTHER THAN APPLE AND APPLE LOOK-A-LIKES- WE HAVE A TEMPLATE TO POSITION A REGULAR ROUND HOLE PUNCH FOR THE READ ENABLE HOLE NEAR THE CENTER

COST— 4 for $200

N.P.S. Inc.
Dept.
1138 BOXWOOD RD JENKINTOWN PA 19046
(215) 884-6010

PREMIUM QUALITY! LIFETIME WARRANTY!

DISK SALE!

Made by top manufacturers, not "seconds." We buy truckloads of major makers' overproduction. They won't let us to reveal their names, but when you receive them you'll probably recognize them as among the HIGHEST QUALITY PREMIUM DISKS made... labeled or unlabeled! Certified, guaranteed 100% error free. MONEY BACK SATISFACTION GUARANTEE! FAST 48 HOUR SHIPPING! "BOXED" comes complete with sleeves and labels, "BULK" does not.

from 33¢

Prices are per disk	BULK 100	BULK 500	BULK 1K	BULK 5K	BULK 10K	BOXED 10	BOXED 100	BOXED 500	BOXED 1K	BOXED 5K
SS/DD 35trk for Apple II series #UDA	45¢	42¢	39¢	36¢	33¢	58¢	53¢	50¢	47¢	44¢
SS/DD for S ngle side computers #UD1	59¢	57¢	55¢	50¢	46¢	75¢	67¢	65¢	63¢	57¢
DS/DD for IBM-PC & compatibles #UD2	67¢	60¢	58¢	56¢	54¢	85¢	75¢	68¢	66¢	64¢
DS/HD "HI DENSITY" for IBM AT #UAT	2.15	2.12	2.10	2.08	1.99	2.40	2.25	2.22	2.20	2.18
3½" SS MAC DISKS #UD3	1.95	1.93	1.90	1.87	1.84	1.99	1.96	1.93	1.90	1.87
5¼" SLEEVES #24 white wove #SLV	4¢	3.5¢	3¢	2.8¢	2.5¢	Specify BULK or BOXED when ordering disks				
5¼" SLEEVES white tyvek #TYV	6¢	5¢	4.5¢	4.3¢	4.1¢					

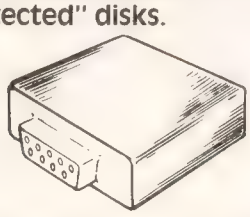
COMPUTER SUPPLIES AT WHOLESALE PRICES!
UNIFILE-10, library storage cases, holds 10 disks 99¢ 10/95¢each
UNIFILE-70, like "Flip-n-file", holds 70 disks $8.88 24/$7.99each
UNIFILE-100, w/lock and key, holds 100 disks $13.88 24/$12.49ea
UNIFILE-40, for 40 "MAC" disks, flip-type $8.88 24/$7.99each
UNI-NOTCH, for Apple/Commodore, accesses 2nd side of disk $9
UNIPAK DISKETTE MAILERS, fits two 5¼" disks 10/$5

HOW TO ORDER: Pay by MC-Visa-Amex-COD or send check with order. Include $3 for shipping & handling +$2 if COD. All orders MUST include daytime phone & street address. Minimum order $20. WE CAN SHIP OPEN ACCOUNT TO SCHOOLS & LARGE FIRMS! Minimum purchase order $100. Money-back 30 day satisfaction guarantee! Send for free flyer with 100's of discount supplies and expansion cards!

TOLL FREE (800)343-0472
IN MASS: (617)"UNI-TECH"
UNITECH 20? HURLEY ST. CAMBRIDGE, MA 02141

PROGRAMMERS!

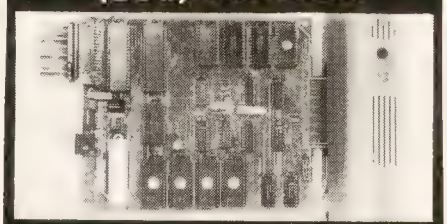
Stop piracy with Datalock security keys. They plug into a joystick port and have many advantages over "protected" disks.



Call or write for more information.

DATALOCK
Manufacturing Company
P.O. BOX 198 STEVENSVILLE, MI 49127
PHONE (616) 465-5264

Marann Enterprises, Inc.
(303) 695-6185



Pro Cartridge for C64/C128
- Loads from reset. 1 to 3 ML or basic programs up to 32K
- 6K Battery backed ram
- Watchdog timer restarts stalled programs
- Punches its own EPROM with addition of 23-50v ac or dc source
- Clock/Calendar chip with alarm and programmable interrupts
- 24 programmable I/O lines
- Gold plated edge connector and sockets

Marann Enterprises, Inc
710 So. Memphis Way
Aurora, CO 80017
(303) 695-6185

STATE-OF-THE-ART MAGNETIC MEDIA

5¼" DISKETTES

- With Hub Rings
- With Write Protect Tabs
- With Static-Free, Dust-Free Envelopes
- With User ID Labels
- In Factory Sealed Poly Packs

69¢	79¢	99¢
Single Side Double Density	Double Side Double Density	Reversible Double Density Double Notched*

*Flip diskette to use both sides on single head drives

100% ERROR FREE - LIFETIME WARRANTY
MEET OR EXCEED INDUSTRY STANDARDS
Minimum quantity 50 diskettes. Discount for 300 or more diskettes. **Shipping and Handling:** $4.00 per 100 diskettes. Reduced shipping charge for larger quantities. C.O.D. add $4.00. Cash or certified check. MI residents add 4% sales tax. Prices subject to change without notice.

VISA C.O.D.

Precision Data Products
P.O. Box 8367, Grand Rapids, MI 49508
(616) 452-3457 • Michigan 1-800-632-2468
Outside Michigan 1-800-258-0028

advertiser's index

Reader Service Number/Advertiser	Page
102 Abacus Software	44,45
103 Acorn of Indiana, Inc.	123
104 A.I.D. Corp.	122
105 Aprotek	4
106 Aprotek	122
107 Artificial Intelligence Research Group	124
108 Basix	34
109 Berkeley Softworks	29
110 Bible Research Systems	42
111 Blackship Computer Supply	127
Cardinal Software	123
112 CDI/Computer Devices International	25
113 Central Point Software, Inc.	60
Cheatsheet Products Inc.	125
C.O.M.B. Direct Marketing Corp.	115
Commodore	BC
114 Commodore Software Association	43
115 Compumed	118
116 CompuServe	2,3
117 ComputAbility	111
118 Computer Magic	110
119 Computer Mail Order	113
120 Cornucopia Software	42
Covox Inc.	110
121 Crown Custom Covers	122
122 CSM Software, Inc.	114
123 Datalock	127
124 Digital Solutions Inc.	127
125 Digital Solutions Inc.	15
Diversions, Inc.	110
126 Dow Jones News/Retrieval	21
127 Electronic Arts	IFC
128 Electronic One	112
129 EPYX	11
130 EPYX	13
131 Grolier Electronic Publishing, Inc.	35
Halix Institute	123
Intelligent Software	112
132 Jacobsen Software Designs	112
John Henry Software	1
Ksoft Co.	118
Lyco Computer	58,59
133 Marann Enterprises, Inc.	127
134 Mastertronic International Inc.	27
135 MegaSoft Limited	22,23
136 MegaSoft Limited	62,63
137 Melodian, Inc.	48,49
138 Michaelsoft	124
139 Micro Prose Simulation Software	37
140 Micro-W Distributing, Inc.	77
Micro World Computers, Inc.	118
141 Midwest Software	123

Reader Service Number/Advertiser	Page
142 Mindscape, Inc.	IBC
143 Nibble Notch Computer Products	118
144 1990 Software	124
145 N.P.S. Inc.	127
NRI Schools	47
On-Line Service	120
146 Precision Data Products	127
147 Protecto	52–55
Research Service Labs	124
148 R. J. Brachman Associates, Inc.	66
149 RJ Softshop	124
Schnedler Systems	116
Second Source Engineering	122
150 Signal Computer Consultants	125
151 Software Discounters of America	117
Sportsware	121
152 subLOGIC Corporation	9
153 subLOGIC Corporation	31
154 T & D Electronics	116
155 T & D Electronics	121
Tektonics Plus, Inc.	92
156 Tenex Computer Express	119
157 Timeworks, Inc.	7
158 Triad Computers	112
159 Tussey Computer Products	61
160 Ultrabyte	66
161 Unitech	127
USA★FLEX	122
Wallstreet Corp.	92
162 White House Computer	114
163 Wicked Wendy's House of Discounts	124
164 Wilanta Arts	120

COMPUTE!'s Books' New Titles	41
COMPUTE!'s Gazette Classifieds	126
COMPUTE!'s Gazette Disk Subscription	17
COMPUTE!'s Gazette Subscription	33
COMPUTE!'s Kids and the 128 and Kids and the Atari ST	39
COMPUTE!'s Programmer's Guides	51
40 Great Flight Simulator Adventures	64
The Turbo Pascal Handbook	57

COMPUTE!'s GAZETTE
FREE Reader Information Service

Use these cards to request FREE information about the products advertised in this issue. Clearly print or type your full name and address. Only one card should be used per person. Circle the numbers that correspond to the key number appearing in the advertisers index.

Send in the card and the advertisers will receive your inquiry. Although every effort is made to insure that only advertisers wishing to provide product information have reader service numbers, *COMPUTE!'s GAZETTE* cannot be responsible if advertisers do not provide literature to readers.

Please use these cards *only* for subscribing or for requesting product information. Editorial and customer service inquiries should be addressed to: *COMPUTE!'s GAZETTE* P.O. Box 5406, Greensboro, NC 27403. Check the expiration date on the card to insure proper handling.

Use these cards and this address only for *COMPUTE!'s GAZETTE* Reader Information Service. Do not send with payment in any form.

COMPUTE!'s GAZETTE

102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152
153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169
170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186
187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203
204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237
238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	350	

Circle 350 for a one year new U.S. subscription to *COMPUTE!'s GAZETTE*. you will be billed for $24.

Please let us know. Do you

own:	plan to buy:
☐ Commodore 64 ____ 270	☐ 271
☐ VIC-20 ____ 272	☐ 273
☐ Plus/4 ____ 274	☐ 275
☐ Commodore 16 ____ 276	☐ 277
☐ Other ____ 278	☐ 279
☐ ____ 280	☐ 281

Please print or type name and address.
Limit one card per person.

Name _____

Address _____

City _____

State/Province _____ Zip _____

Country _____

Please Include ZIP Code Expiration 4/30/86 G386

ORDER A SUBSCRIPTION TO COMPUTE!'s GAZETTE.

For Fastest Service, CALL **TOLL-FREE 800-334-0868**

☐ $24.00 One Year US Subscription
☐ $45.00 Two Year US Subscription

Name _____

Address _____

City _____ State _____ Zip _____

☐ Payment Enclosed ☐ Bill Me
Charge my ☐ Visa ☐ MasterCard ☐ American Express

Account No. _____ Exp. ____/____

Your subscription will begin with the next available issue. Please allow 4-6 weeks for delivery of first issue. Subscription prices subject to change at any time. I1783

Place
Stamp
Here

COMPUTE!'s GAZETTE Reader Service
P.O. Box 2161
Radnor, PA 19089

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 7479 DES MOINES, IOWA

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTE!'s GAZETTE
PO BOX 10957
DES MOINES, IOWA 50347

Shake, battle & role.

Warm up your Commodore® and get ready for full-screen graphic action.

Save the industrial world from going off the deep end of the Richter scale in *Quake Minus One*. Stop the terrorists from triggering a massive earthquake and toppling civilization.

In *Shadowfire*, Ambassador Kryxix has been kidnapped. You have but 100 real-time minutes to assemble a strike force of specialists and elite fighters to rescue him and then destroy the evil Zoff and his starship.

Embark on a quest to defeat Doomdark in *The Lords of Midnight*. Choose your role. Capture the source of Doomdark's power or conquer his forces in battle. Over 32,000 different panoramas ensure a challenge.

Visit your software dealer. Ask to see the new Beyond Line from Mindscape. And discover graphics, adventure, excitement, and fun that's beyond belief.

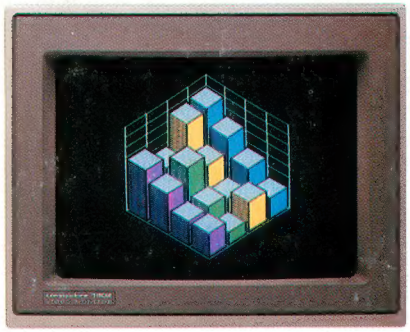
Mindscape

Software that challenges the mind.

Mindscape, Inc. 3444 Dundee Road, Northbrook, Illinois 60062 1-800-221-9884. (In Illinois 1-800-942-7315)

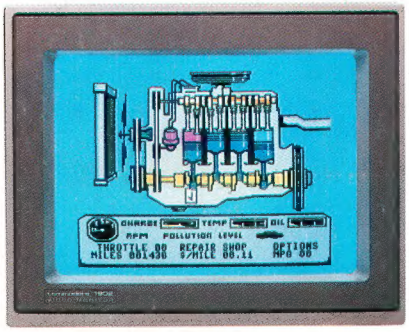
© 1985 Mindscape, Inc. All rights reserved. © 1985 Beyond. Licensed in conjuction with International Computer Group. Commodore is a trademark of Commodore Electronics Ltd.
Mindscape is a trademark of Mindscape, Inc.

All you need to do this



graph a spreadsheet

write a novel



fix an engine

compose a song

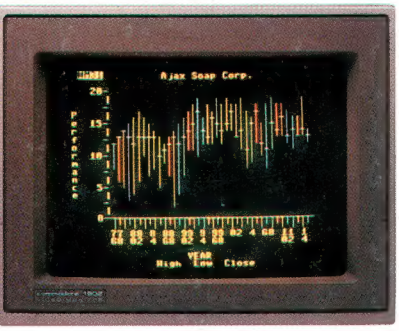
paint a picture

banking

learn to fly

organize a data base

tell a story



forecast sales

When it comes to personal computers, you want the smartest, at a price that makes sense.

The new Commodore 128™ system has a powerful 128K memory, expandable by 512K. An 80-column display and 64, 128 and CP/M® modes for easy access to thousands of educational, business and home programs. And a keyboard, with built-in numeric keypad, that operates with little effort.

Or if the Commodore 128 is more machine than you had in mind, you can pick up the Commodore 64.® The Commodore 64 is our lower-priced model geared to more fundamental, basic needs.

Discover personal computers that do more for you. At prices you've been waiting for. From the company that sells more personal computers than IBM® or Apple.®

© 1985, Commodore Electronics Limited
® CP/M is a registered trademark of Digital Research, Inc.
® Apple is a registered trademark of Apple Computer, Inc.
® IBM is a registered trademark of International Business Machines Corporation
® Commodore 64 is a registered trademark of Commodore Electronics, Ltd.

COMMODORE 128 AND 64 PERSONAL COMPUTERS

A Higher Intelligence

Made with love by

RetroMags

20+ Years

Our goal is to preserve classic video game magazines so that they are not lost permanently.

People interested in helping out in any capacity, please visit us at retromags.com.

No profit is made from these scans, nor do we offer anything available from the publishers themselves.

If you come across anyone selling releases from this site, please do not support them and do let us know.

Thank you!